PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Vol. 108, No. 19 Thursday, May 11, 1939 Price Ten Cents

High Cost of Accidents in Mills and Woods

Quebec Pulp and Paper Safety Association At Meeting Discusses High Cost of Accidents To Workers In Sawmills and Woods — Compensation This Year Estimated At $1,200,000—Drop In 1938 Due To Lower Output.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 8, 1939—The Quebec Pulp and Paper Safety Association, at its annual meeting in Quebec City had presented before it some interesting views regarding the high cost of accidents in woods operations in the province and prospective decrease in these costs.

W. L. Bennett, of the Brown Corporation, who presided, said it would appear that strenuous and co-operative efforts have been successful in reducing accidents in the woods, but that the results have not been as satisfactory in the mills. The sawmill industry levied toll upon the newsprint industry, and the transfer of $100,000 from the newsprint industry fund to the sawmill industry fund resulted in the fact that there was no reduction in rates, although the surplus for 1937 and 1938 has taken the newsprint industry out of the "red," but, as comments the report, "without leaving any real favorable balance.

Mr. Bennett comments: "By the end of 1939, with the continued cooperation of all employers, we may well look for a substantial reduction in the premium now being paid for accident insurance."

Compensation for Year $1,200,000

Paul Drouin, K. C., Chairman of the Commission administering the Workmen's Compensation Act, said that the forestry industry, in its various branches, has paid $5,700,000 to the Workmen's Compensation Commission and this year there will be another $1,200,000 paid.

There was much said as to the cordial relations between the present commission and the representatives of the forestry industry, as represented in the association. It was pointed out, that of the 154 companies operating, 63 had shown on operations a surplus of $785,000, but the other employers had shown an aggregate deficit of $887,000. The trend of the report in this respect indicated that the larger employer works harder and is more successful in preventing accidents than the "little" employer.

It is admitted that decrease in accidents in 1938 was substantially due to decrease in operations, but also, it is emphasized, to increased attention given accident prevention work, especially in the woods. In the mills there is an increase in minor injury cases, as against a decided drop in more serious cases, and there is demand that the mills do more in the matter of accident prevention.

Decline in Woods Accidents

Of interest are the figures as to accident for 1936, 1937 and 1938. For 1936, the claims requiring medical aid only totalled 1316. In 1937 this figure rose to 2012, and for 1938 the jump was to 2,783. These figures deal only with medical aid cases. As regards compensation cases arising from accidents in mills, it is shown in the report that the number of such cases was 680 in 1936, that it was 904 in 1937, but there was a sharp drop to 728 for 1938 due to lessened production.

Turning to woods operations, the situation changed materially during the three years under review, dropping from 7,946 cases requiring compensation in 1936, to 6,496 cases in 1938, two years later.

The hope was expressed by various speakers at a round table conference that with greater co-operation it would be possible to reduce accident costs to such a point as to enable substantial reduction in rates payable.

The officers elected are: W. L. Bennett, president; H. S. Spencer, vice-president; G. H. Bridge, treasurer; A. S. Cook, of Price Brothers, secretary.

Allied Paper Mills To Hold Election

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 10, 1939—The National Labor Relations Board has announced that an election would be held within 15 days among hourly paid employees of the Allied Paper Mills, King Division, Kalamazoo, Mich., to determine whether they desire to be represented by the United Paper Mills Workers' Local Industrial Union 398, an affiliate of the Congress of Industrial Organizations.

The union claimed to represent a majority of the employees in the appropriate unit. However, the only evidence introduced was oral testimony by one of its officers and no showing was made sufficient for purposes of certification by the Board upon the record. Consequently, a secret ballot election was directed.

Wisconsin Enacts Laws for Labor Peace

Bill Codifying Six Laws Relating To Water Regulations By Paper Mills and Power Companies On Wisconsin River Up For Passage — State's "Little Wagner Act" Passed In 1937 Repealed—Other Late Trade News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 8, 1939—Passage of a bill in the Wisconsin Legislature which will codify six laws relating to its operations is sought by the Wisconsin Valley Improvement Company, Wausau, Wis., a corporation of the paper mills and power companies regulating and unifying the flow of the Wisconsin River. Fred W. Genrich, secretary, W. F. Brooks, general manager, and W. Kyler, engineer of the company appeared before the judiciary committee of the Senate last week urging passage.

The bill seeks to return to the company the right of eminent domain taken away from it by an amendment passed in 1935. Otherwise, the bill merely ties into one chapter scattered provisions.

Another law enacted by the present Legislature and signed by Gov. Julius P. Heil will help to assure labor peace in Wisconsin. It repeals the state's "little Wagner Act," passed in 1937, which afforded no protection to employers. The former labor relations board is abolished, and a new one of three members is to take its place, to be appointed by the governor for six years with the consent of the Senate.

Provisions of the peace act of interest to industry are: Outlaws sitdown strikes. Requires ten days' notice to the employer of strikes affecting perishable agricultural products. Forbids closed contracts except through agreement by 75 per cent of the bargaining union membership. Prohibits secondary boycotts against employers. The check-off system of collecting union dues is forbidden except with written consent of the worker. "Stranger" picketing, which has been outlawed in the Catlin bill (picketing of establishments where the workers are not on strike) is also declared illegal in this act.

Stevens Point Mill Closed Temporarily

Because of unfavorable market conditions, the Stevens Point Pulp and Paper Company, Stevens Point, Wis., closed down its McDill plant May 3 for a temporary period. Officials are of the opinion the shutdown will extend through the summer, but resumption will depend upon better market conditions.

Importations of pulp into the United States from Scandinavian countries at a price that could not be met with costs of production here are responsible for the company's action. The mill normally employed 75 men, but has been operating with half a crew recently. Only a skeleton crew will be maintained, including office workers.

Buildings of Old Island Mill Removed

Workmen employed by the Meade Paper Corporation of Chillicothe, Ohio, have begun demolishing completely the water power buildings at the former Island Paper Company mill at Menasha, Wis., idle for several years. Transformers are being removed, and the buildings will soon be removed. The company took this step to reduce taxes on the property.

The Island mill was built in the early seventies by C. W. Howard. Later it was taken over by a group headed by a Mr. Ryder of Oshkosh, Wis., but was returned again to the ownership of Mr. Howard.

The Island Paper Company was organized in 1904 by the late John Strange, who continued at the head of the industry only about a year. The plant was then taken over by A. N. Strange and D. T. H. MacKinnon, with John Strange devoting his entire time to the John Strange Paper Company.

Institute of Paper to Confer May 18

Leading executives of member mills of the Institute of Paper Chemistry, Appleton, Wis., will gather in Appleton for their annual conference Thursday and Friday, May 18 and 19. A meeting of the board of directors will precede the general sessions.

Edward Meyer Retires from Construction Firm

Edward H. Meyer has resigned as president of C. R. Meyer & Sons Construction Company of Oshkosh, Wis., and has disposed of his interest in the concern. He has been president since 1934. Harry D. Meyer, who has been vice-president and secretary, will succeed him. This company has for many years been engaged in the construction of paper mills, water power dams, and other projects allied to the paper industry. Last week the company was awarded second place in competition for the Swenson trophy, national safety award.

Consolidated Signs Labor Agreement

Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., negotiated and signed its twenty-first annual labor agreement with four international unions affiliated with the American Federation of Labor at a one-day conference May 2.

The agreement covers the company's four mills at Wisconsin Rapids, Biron, Stevens Point and Appleton, Wis., and provides for a continuance of wage scales and other provisions in effect during the last year. The only change was a slight stipulation showing company compliance with the federal wage-hour law.

George W. Mead, Consolidated president, addressed the conference at its morning session on general business conditions and the outlook in the paper industry. Representatives of the company in the negotiations were Leo. J. Barrette, labor relations manager, and the four mill managers, C. E. Jackson, Wisconsin Rapids division; C. K. Boyer, Appleton, division; Warren Beadle, Biron division, and Harry Adrian, Stevens Point division.

Northeast Chemists Meet May 17

Election of officers of the Northeast Wisconsin section of the American Chemical Society will take place at its meeting May 17 at Appleton, Wis. There will also be an address by Dr. Charles Kraus of Brown University, Providence, R. I., president of

the American Chemical Society. At the April meeting, the members heard an address by Dr. Kasimir Fajans, professor of Chemistry at the University of Michigan.

Combined Locks Co. Moves Offices

Combined Locks Paper Company has discontinued its downtown offices in the Insurance Bldg. at Appleton, Wis. An addition has been completed at the company's mill at Combined Locks, where the offices will hereafter be located. The move was made last week.

Kenneth A. Craig Goes to Kimberly-Clark

Kenneth A. Craig has resigned as assistant professor of Chemistry at Lawrence College, Appleton, Wis., in order to accept a position in the research department of the Kimberly-Clark Corporation, Neenah, Wis. He had been on the Lawrence faculty since 1936. Mr. Craig is prominent in the American Chemical Society, in whose journal a number of his articles have appeared. He is secretary of the Northeast Wisconsin division of the society.

Thilmany Adds to Bag Mill

Construction has been started by Thilmany Pulp & Paper Company on an addition to its bag mill, estimated to cost $20,000. The contract has been awarded to Permanent Construction Company, Milwaukee, Wis., builders of the original mill.

The addition will be 44 by 200 feet, and of the same height as the present bag mill. It will permit expansion to relieve overcrowding of the bag division, and the company also plans to install additional equipment.

Coal Shortage Reported by Some Mills

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., May 8, 1939—As a result of the bituminous coal strike a number of the industrial plants in this section are experiencing a shortage. The St. Regis Paper Company and subsidiaries, including the Taggart Brothers mill at Watertown, received about 2,400 tons by water through Oswego from Canada several days ago but is now nearing the bottom of its pile. Early last week about 5,000 tons were received in this city and a substantial share went to the Algonquin Paper Company which is now well supplied for the immediate future. The firm of Knowlton Brothers, Watertown, has a supply sufficient to last approximately two weeks or more. Some soft coal has filtered into this section during the past two weeks through bringing back shipments consigned to Canada and through deliveries of so-called strip coal, which is of not very good quality.

H. B. Parmele To Manage Troy Branch

Announcement by Charles F. Hubbs & Co. has just been made of the appointment of Harry B. Parmele as manager of their branch at 124 Ferry street, Troy, N. Y. Mr. Parmele has had a wide experience in selling and has a large acquaintance in the paper industry so that his appointment should assist in the further development of the business of Charles F. Hubbs & Co. in the Albany area. R. C. Simpson and G. F. Clarke, who have been selling from the Troy House for many years, will continue to serve the trade in that district.

New Firm to Start Childsdale Mill

[FROM OUR REGULAR CORRESPONDENT]

GRAND RAPIDS, Mich., May 8, 1939—Multicolor Packages, Inc., with an authorized capital of $1,000,000 preferred stock and $100,000 common stock, organized to take over the Childsdale mill property on Rogue river, near Rockford, was incorporated Friday and will be in active operation in 60 days, principals said, producing colored and embossed boxboard for shipping containers and other purposes.

The property, with 330 acres of land and with flowage and water rights and the mill dam, as well as the mill which is 193 feet long, and 151 feet wide at one end and 103 feet at the other end, was purchased from the receiver of the American Home Security bank.

The American Appraisal company, organizers of the new firm appraised the property at $161,200, as the cost of reproduction less depreciation.

Plans are being made for erection of a two-story addition 200 feet by 100 feet at the east end of the plant, which now houses paper-making machinery. New equipment for the color processes will be installed in the new portion of the plant.

By October 1, it is expected, 40 men will be employed in the plant, and it was said that this number will be doubled when new machinery is installed.

Fred George, former president of the Continental Color corporation, former bank executive who developed the Continental process, said the Childsdale plant was selected from several in various parts of the country as the most suitable, being flexible, with low overhead.

Difficulty in getting boxboard stock of quality to insure uniform absorption made necessary the setting up of a plant for the manufacture of package materials, he said.

Mr. George will move to Grand Rap as will Herbert E. Jones, for 27 years with Central Paper company at Muskegon; Norman Clark, chemical research man now with Alt & Wiberg, Cincinnati; and L. M. Umsted. Louisville, Ky., who handled the purchase of the property near Rockford.

Must Disestablish Bargaining Agency

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 3, 1939—The National Labor Relations Board has announced an order, based upon a stipulation, requiring the Lebanon Paper Box Company, Lebanon, Pa., to disestablish the Independent Workers Lebanon Paper Box Company as a collective bargaining agency and to inform in writing its officers that the company will not in any way deal with or recognize it as a labor organization with regards to working conditions.

The company agreed, and the Board ordered it to inform all of its officials and agents, including superintendents, foremen and other supervisory employees, that they shall not in any manner approach employees concerning or discuss with them the question of their labor affiliation, or threaten employees in any manner because of membership in any labor organization in general, or the Amalgamated Lithographers of America, affiliated with the American Federation of Labor, in particular.

The company agreed and the Board ordered it to post for a period of 30 days copies of the Board's order, and, within 30 days, notify the Regional Director for the Fourth Region of compliance.

Midwest Expecting Sharp Upturn in Trade

Chicago Market Reported Quiet With Prices Holding Firm and Merchants Looking Forward To Substantial Increase In Demand In Near Future — Paper Men Attend Safety Meeting — Truck Bill Is Opposed.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 8, 1939—The Chicago paper market shows little indications of activity this week. Described as "somewhat stagnant" by several who were interviewed, most markets are quiet though with a comparatively firm price undertone. It is the feeling of many observers that the paper industry is simply feeling the effects of a nationwide business "hesitancy" which is expected to be broken through in vigorous style before late Spring.

Demand for Kraft Paper Steady

Kraft papers continued to be one of the best of the group during the week with demand continuing steady. Groundwoods also were reported as doing well while newsprint paper was reported as slightly improved. Book and cover paper representatives were only mildly enthused over the immediate outlook, taking chief comfort over the stability of the general picture. Sulphites were unchanged while the range of bonds and ledgers offered little for news comment. Waste papers continued firm with a fair amount of demand on hand.

Paper Executives on Safety Program

The seventeenth annual Midwest Safety Conference sponsored by the Greater Chicago Safety Council and a number of cooperating agencies, is to be held next week in this city. More than seventy five exhibitors will display the latest products designed to eliminate accident hazards as a feature of the four day program. A number of executives identified with the paper industry have been scheduled to speak before certain of the groups. John H. Holzberg, personnel manager of the Chain Belt Company, Milwaukee and J. J. Plzak, claims manager of the Consolidated Water Powers & Paper Company of Wisconsin Rapids are to participate in a panel discussion on the fundamentals of industrial safety on May 9 while F. A. Robinson, industrial relations department of the Kimberly-Clark Corporation, Neenah, is to participate in a discussion covering the maintaining of interest in industrial safety work on the morning of May 10. Similar forum discussions on public safety, the injured worker, occupational diseases and training in industrial safety are to be held through the week. The session will be climaxed on the evening of May 11 by the seventeenth annual banquet to be addressed by C. M. White, vice president in charge of operations of the Republic Steel Corporation, Cleveland, Ohio. George G. Traver, manager of the Greater Chicago Safety Council, is in charge of arrangements for the conference which gets under way Tuesday morning, May 9 with all sessions scheduled to be held at the Sherman Hotel.

Link-Belt Consolidation

Consolidation of Speeder Machinery Corporation, Cedar Rapids, Iowa, manufacturers of power operated excavating and materials handling shovels, draglines, cranes and the Shovel Division of the Link-Belt Company has been announced by Alfred Kauffmann, President of Link-Belt Company. Combined facilities and full control of all sales and manufacturing operations are expected to benefit both production and distribution. T. M. Deal will continue as president of Speeder Machinery which will be operated as a subsidiary of Link-Belt with the present management continuing to operate the business.

Oppose Illinois Truck Bill

Motor carriers, trucking interests and shippers are concentrating their opposition on Senate Bill 155 now before the Illinois legislature which seeks to bar trucks, with a few exceptions, from the highways from midnight Friday until 6 a. m. Monday on every week-end legal holiday throughout the year. Described as an unwarranted measure which would work an undue hardship on business, the industry and the shipping public, the bill will be heard next week with many executives, some of them identified with the paper industry, expected to register strong opposition.

Midwest SAPI Meets

The Salesmen's Association of the Paper Industry, midwest division, held a most interesting luncheon meeting Monday, May 1, at which time the various "travelers" of the association reported on two major events which they had attended. In his own very interesting style, Phil Howard, publisher of the American Paper Merchant, described "paper week" at Savannah, giving a most accurate eye version of the many interesting sidelights on this event. Other members described the Omaha Union Pacific celebration which seems to have been the "port of call" for quite a few.

Time was also given to further publicize the initial golf outing which, according to golf chairman George Crafts is to be held at the Sunset Ridge Country Club on Friday, May 26.

To Start Sulphite Mill at Dexter Soon

[FROM OUR REGULAR CORRESPONDENT]

DEXTER, N. Y., May 8, 1939—The sulphite mill of the Dexter Sulphite Pulp and Paper Company is expected to be ready for resumption of operations following repairs and improvements which have been in progress for the past few weeks. It was learned that the sulphite department was not in very good condition and apparently was not kept in repair for several years. This situation together with the extensive dismantling of it by the company when operations were suspended early in the year left much to be done to restore it to good condition. However, when the repairs are finished it will again be in excellent condition and it is contended that the receivers can produce sulphite there at a profit. The paper mill of the company has been in operation for the past month on a satisfactory basis.

Abitibi Creditors Meet to Protect Claims

Clement Tremblay, Chairman of Trade Committee of Abitibi Power & Paper Co. Stresses Need For Cooperation of All Creditors To Protect Their Claims—Mills Renew Wage Agreement With Union—Other News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 8, 1939—A letter sent out over the signature of Clement Tremblay, chairman of the general trade creditors' committee of Abitibi Power & Paper Company to over 700 creditors holding claims totaling $694,236, stresses the need for close co-operation of all creditors in order that their claims may be adequately protected. The letter reads in part as follows: "An informal meeting of the principal unsecured creditors was held for the purpose of considering what action might be taken to preserve their claims in the event of a forced sale of assets or in the event of the presentation of any scheme of reorganization which made no adequate provision for the payment of general trade claims.

"R. S. McPherson, C.A., the liquidator, furnished a list of claims of unsecured creditors which had been admitted, to the amount of $694,236.64. The claims represented at the first informal meeting of creditors amounted to $529,128.98, or 76 per cent of claims admitted.

"A second informal meeting of unsecured creditors was held March 17, at which a Protective Committee was appointed for the purpose of representing such creditors.

"Subsequent to these meetings, as was anticipated, the bondholders' protective committee announced a scheme which contemplated a forced sale of assets, and which made no cash provision for the unsecured creditors, and which in effect would probably represent a total loss to such creditors. The bondholders' plan was not submitted directly or indirectly for the consideration of the unsecured creditors before it was made public.

"After consultation with the liquidator and his solicitors, your committee felt that it would be advisable to take the advice of counsel as to the best procedure to be adoped to protect the claims of unsecured creditors. Your committee accordingly consulted Fraser, Beatty, Palmer & Tucker, Toronto, and that firm is proceeding with the preparation of documents.

"Your committee has consulted with members of the bondholders' preferred and common shareholders' committees, and they have indicated that they are willing to co-operate in an effort to reach a fair and equitable compromise.

"The requisite documents and explanatory material will be sent to you in due course. In the meantime, the secretary of the committee will be pleased to respond to enquiries from unsecured creditors."

Abitibi Shipments Higher

Shipments of newsprint in March, according to G. T. Clarkson, receiver and manager, amounted to 22,333 tons compared with 20,542 tons in February and with 18,239 tons in March 1938. Present indications are that shipments of newsprint in April will be about 24,000 tons compared with 22,001 tons in April last year.

Shipments of sulphite pulp in March amounted to 3,461 tons compared with 2,846 tons in February and 2,183 tons in March 1938. Present indications are that shipments of sulphite pulp in April will be approximately 3,000 tons against 2,841 tons in April last year.

A. A. Schmon, president and general manager of Ontario Paper Company Limited, has joined the Board of Directors of Industrial Acceptance Corporation Limited. Mr. Schmon is vice-president and director of the Quebec Logging Corporation, Quebec and Ontario Transportation Company, Manicouagan and English Bay Export Company, and Lower St. Lawrence Navigation Company, and director of the Quebec Forest Industries Association, Laurentian Forest Protective Association and Canadian Forestry Association.

Timber and Pulp Inquiry Starts Soon

A post session inquiry into the administration of Ontario's timber and pulp wood resources may last two months, Premier Mitchell Hepburn said. The Premier will confer with Conservative leader George Drew on the membership of the legislature committee that is to make the inquiry.

In the legislature, the Premier said he hoped the investigation into the Lands and Forests Department would be thorough and complete.

Though the motion has been accepted debate on it is unfinished. Hon. Peter Hepburn, Lands and Forests Minister, welcoming the inquiry, adjourned discussion on it. "I want the committee members to do their duty" said Premier Hepburn. "If there are timber pirates, I want them shown up."

Four Mills Renew Wage Agreements

Subsequent to negotiations carried out during the past month between officers of Hall District Council of Paper Mill Unions and executive of forest industries in Ottawa district wage and working condition agreement have been renewed for the forthcoming year, effective May 1, it was announced lately.

The four companies which renewed agreements are: The E. B. Eddy Company Limited; J. R. Booth, Limited; Canadian International Paper Company Limited, and Continental Paper Products Limited.

Working conditions and wages in the four industrial concerns will be the same as during the past year, Fred Dickens, president of Hull District Council of Paper Mill Unions, said.

Unions represented at the conferences between unions and management were the International Brotherhood of Papermakers, and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

Mr. Dickens announced that Quebec Premier Maurice Duplessis had tentatively accepted the invitation of Hull District Council of Paper Mill Unions to address their semi-annual convention at their concluding banquet on June 11.

Financial News of Pulp and Paper Industry

Reduced Income For Union Bag—American Writing Shows Profit—Reorganization Scheme For Lake Sulphite — Parrafine Reports Earnings—Scott Paper Declares Dividend — Directors Re-elected By International.

New York Stock Exchange

High, Low and Last for the Week Ending May 10 1939

	High	Low	Last
Armstrong Cork Co.	39½	38½	38½
Celotex Corp.	12¾	11⅝	12⅜
Celotex Corp., pf.	66	64½	66
Certain-Teed Products Corp.	8⅜	7½	8⅛
Certain-Teed Products Corp., pf.	30½	28	29½
Champion Paper & Fibre Co.	21¾	20½	21¾
Congoleum-Nairn Co.	23	22¾	22¾
Container Corp. of America	10⅞	10¼	10⅝
Continental-Diamond Fibre Co.	6⅛	6	6
Crown-Zellerbach Co.	11	10¾	10¾
Crown-Zellerbach Co., pf.	78⅞	77½	77¾
Flintkote Co.	20¾	19½	20¼
Robert Gair	2⅜	2⅜	2⅜
Robert Gair, pf.	9¼	9	9
International Paper & Power	9⅛	8⅛	8¾
International Paper & Power, pf.	32¾	30⅝	31¾
Johns-Manville Corp.	73½	71	72¼
Johns-Manville Corp., pf.	125	125	125
Kimberly-Clark Corp.	22½	22½	22½
MacAndrews & Forbes	29	29	29
Masonite Corp.	40¼	39½	40¼
Mead Corp.	8⅞	8⅜	8⅞
Paraffine Companies, Inc.	44½	43	44½
Paraffine Companies, Inc., pf.	100	100	100
Rubberoid Co.	23	21	23
Scott Paper Co.	47½	46½	47½
Sutherland Paper Co.	27	25½	27
Union Bag & Paper Corp.	8¾	8¼	8½
United Paperboard Co.	4⅝	4⅜	4⅝
U. S. Gypsum Co.	86	83	85½
U. S. Gypsum Co., pf.	171	171	171

New York Curb Exchange

High, Low and Last for the Week Ending May 10 1939

	High	Low	Last
American Box Board Co.	6¾	6½	6¾
Brown Co., pf.	15	14½	14½
Great Northern Paper	36¼	36¼	36¼
St. Regis Paper Co.	2½	2	2⅛
Taggart Corp.	3½	3¼	3¼

Union Bag Nets $153,490 in First Quarter

The Union Bag and Paper Corporation in the first quarter this year earned net income of $153,490, equal to 12 cents a share on the 1,262,729 shares of capital stock now outstanding, according to a statement made today by Alexander Calder, president. This was after all expenses including provision for Federal income and capital stock taxes, and compared with net income of $354,250, equal to 28 cents a share on the basis of the same number of shares, for the first quarter a year ago.

Net income for the 12 months ended March 31, this year, totaled $703,131, or 56 cents per share of capital stock now outstanding, to compare with $1,461,928, or $1.16 per share on the same number of shares, for the preceding 12-month period ended March 31, 1938.

Dollar sales for the first quarter this year were maintained at nearly the same level as in the corresponding quarter last year, amounting to $3,805,052 and $3,908,854, respectively. Sales for the 12 months to March 31, this year, totaled $16,414,074 to compare with sales of $15,721,907 for the preceding 12 months ended March 31, 1938.

"Lower industry price levels during the past 12 months account for the reduction in profits," Mr. Calder said in comment on the report. "However, evidence of the progressive improvement that occurred during the first quarter of this year is apparent from a comparison of the individual monthly profits figures.

"Estimates show net profits of $1,317 for January, due in part to the fact that the entire Savannah plant was shut down for about ten days for overhauling, this being the first major shutdown for that purpose since the first unit came into production, and also to some curtailment of buying due to the announcement of higher prices. This curtailed buying carried into February in which month there was an estimated net profit of $38,822. March, however, reflected the return of buying and the higher prices, the estimated profit for that month being $113,351."

American Writing Earns $26,321

The American Writing Paper Corporation reported yesterday a net profit of $26,321 for the first three months of this year after all expenses and after setting aside $78,962 for interest on its general mortgage bonds. The indenture of these bonds provides that, until Dec. 31, 1940, after which time the rate of 6 per cent will become fixed, 75 per cent of the available income shall be applied toward interest on the bonds to a maximum of 6 per cent.

For the first three months of last year there was a loss of $22,245, before providing for interest on the general mortgage bonds.

No Bids for Lake Sulphite Property

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 8, 1939—No offers were received by George S. Currie, receiver for the properties of Lake Sulphite Pulp Company, Red Rock, Ontario, up to the date named by the receiver for receipt of bids. It is known that at least one group is interested in rehabilitation of the property but the time is not considered opportune to carry out a reorganization. When conditions improve, especially in the sulphite industry, a scheme of reorganization will be placed before the receiver, it is stated.

Paraffine Nets $336,398

Paraffine Companies, Inc., for March quarter, report a net profit of $336,398, equal after preferred dividend requirements to 66 cents a common share, against $364,260, or 71 cents a share, preceding quarter and $117,459, or 20 cents a common share, in March quarter of 1938. Nine months ended March 31: Net profit $2.03 a common share, compared with $1.99 a common share a year before.

Scott Paper Co. Declares Dividend

The board of directors of Scott Paper Company, Chester, Pa., has declared a quarterly dividend of 40 cents per share on the company's common shares, payable June 15, 1939 to shareholders of record June 1,

1939. A regular quarterly dividend of $1.12½ per share on the company's $4.50 cumulative preferred shares was also declared, payable August 1, 1939 to shareholders of record July 20, 1939.

International Paper Co. Meets

Stockholders of the International Paper and Power Company held their annual meeting in Boston last week, with President Richard J. Cullen in the chair.

Stockholders re-elected the 14 directors and heard President Cullen read a statement regarding business conditions and recent developments affecting the company's relation to the public utility holding company act.

There were represented at the meeting 459,218 shares of 5 per cent preferred stock and 1,137,265 shares of common stock, a total of 1,596,483 shares.

To the question, "Are there any prospects for preferred dividends?" Mr. Cullen answered in the affirmative.

Special Master for Brown Co. Named

PORTLAND, Me., May 8, 1939—Federal Judge John A. Peters last week named Edward W. Wheeler of Brunswick, vice president and general counsel to the Maine Central Railroad, a special master in the reorganization of the Brown Company.

The pulp and paper concern, which has general offices here, has been promised a $9,000,000 loan from the RFC contingent upon its presenting a plan of reorganization under section 77-B of the National Bankruptcy Act.

Abitibi Earns $150,400 in March

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 8, 1939—Earnings of Abitibi Power and Paper Company for March 1939, prior to charges for depreciation and bond interest, including interest and overdue and unpaid interest, amounted to $150,400 compared on a similar basis with $125,556 in February and $140,258 in March, 1938.

United Paperboard Has Loss

The United Paperboard for the quarter ended Feb. 25, reports a net loss of $14,918; for quarter ended Feb. 26, 1938, net loss $14,073. For nine months ended Feb. 25, net loss $15,292; for nine months ended Feb. 26, 1938, net income $48,938, or $3.79 a share on 6 per cent preferred stock.

Puget Sound Earns $12,615

Puget Sound Pulp and Timber Company and subsidiary for March quarter reports a net profit of $12,615, equal to 10 cents each on 123,637 shares of 6 per cent cumulative convertible preferred stock of $20 par value. Comparison unavailable.

Advance Bag Reports Loss

The Advance Bag and Paper Company, Inc., report for 1938, net loss of $117,558, contrasted with 1937 net income of $436,012, equal after dividend requirements on prior lien shares and preferred stock, to $14.10 each on 18,272 common shares.

Obituary

Henry M. Fischer

Henry M. Fischer, 60, Pacific Coast manager of Zellerbach Paper Company, died suddenly of a heart attack in his Mayflower Hotel room in Washington, D. C., on April 24.

Mr. Fischer was found unconscious by his wife, Blanche, and died before the house physician reached the room, according to advices from Washington.

Mrs. Fischer, it was learned, had been visiting in the East for six weeks and was joined by her husband only a week ago. Their home was at 2090 Pacific avenue, San Francisco, Cal.

Surviving are his widow, four daughters, Mrs. Ned Parlett of San Mateo, Mrs. Virginia Clapp of San Diego, Mrs. D. W. Edwards of Atchinson, Ga., and Mrs. Harriet Webb of Winterhaven, Fla.

Sabin Robbins

Sabin Robbins, chairman of the board of directors of the Sabin Robbins Company, paper merchants, Cincinnati, Ohio, died in the Holmes Hospital April 30. He was 62 years old.

A native of Cincinnati, Mr. Robbins moved to Middletown, Ohio, when his father founded the Sabin Robbins paper firm there in 1884. The son became associated with the business when he was 18 and in 1908 he succeeded to the presidency.

In 1924 Mr. Robbins moved the company to Cincinnati. Six years ago he relinquished the presidency and became chairman of the board. He was a member of the Cincinnati Country Club.

Surviving are his widow, one daughter and one son.

Spottswood C. Foster

Spottswood Carmichael Foster of Big Island, chief engineer of the Bedford Pulp & Paper Company and the Hydroelectric Corporation of Virginia, Bedford, Va., died April 22, at the University of Virginia Hospital. He was stricken with a heart attack in Charlottesville on the previous day.

Besides his engineering activities, Mr. Foster was vice president of the Bank of Big Island and vice president of the Big Island Realty Company. He was a member of the following organizations: Engineers Club of Philadelphia, Society of Virginians, Virginia Society of Professional Engineers, Illuminating Engineering Society, Society of American Military Engineers, American Institute of Electrical Engineer, Southern Gas Association, Southeastern Division of American Pulp and Paper Superintendents Association, Lynchburg Lodge of Elks, Big Island Lodge of Masons, Woodmen of the World and the Lions Club of New Castle.

He is survived by his wife, a daughter, Miss Irwin Foster, and a son, Sportswood Carmichael Foster, Jr., all of Big Island.

Funeral services were conducted at Fauber's Chapel in Lynchburg on April 24 by Rev. John Myers, of Big Island Methodist Church, assisted by Rev. J. H. Vaughan. Burial was in Spring Hill Cemetery. The Masonic Lodge of Big Island, members of which served as honorary pallbearers, had charge of the service at the grave.

Reliance Demonstrates New Adjustable-Speed Drive At Cameron Plant

An all-electric, a. c., adjustable-speed drive which employs a proven principle of speed control heretofore confined to large units has been developed by the Reliance Electric & Engineering Company of Cleveland, Ohio and was demonstrated Monday morning of this week before an interested group of observers at the plant of the Cameron Machine Company, Brooklyn, New York.

The new drive consists of a control unit and an adjustable-speed motor which is applied directly to the machine to be driven. This speed-changing combination is intended to bring to motor users having only an alternating current power supply an economical means of varying the operating speeds of their small motors (from one hp. up) over as much as a 12 to 1 range.

To be produced in quantity for off-the-shelf delivery, the Reliance VS drive, as it will be known, is composed of elements already common to the ordinary squirrel-cage motor and d.c. generator. In fact, all of the new unit's electrical and mechanical parts are similar to those handled regularly in the maintenance work of any plant, however small.

The speed control unit has been designed for use on three-phase, 60-cycle, 220, 440, and 550 volt a.c. circuits. Of vertical construction, it occupies a minimum of floor space and can be mounted anywhere in the shop. Three screws are all that are required to fasten its base to the floor or other support, and no careful leveling is needed. Three wires from the a.c. power source are connected to the control unit exactly as would be done with any motor and control. From the control unit, secondary circuits are run to the driving motor, to a speed adjuster, and to start and stop buttons. Both the speed adjuster, which is no larger than a pie plate, and the buttons for starting and stopping the motor, can be located within arm's length of the machine's operator.

The driving motor is a Reliance Type T, designed particularly for adjustable-speed service. It can be supplied in a variety of types, including enclosed fan-cooled, splash-proof and explosion-proof. Gear-motors may also be used. Connection to the driven machine may be by any of the methods regularly used for direct motor-drives. Considerable space is saved because no intermediate devices are required for the speed changing.

NEW RELIANCE DRIVE APPLIED TO CAMERON WINDER

This Drive Provides a Low Speed for Threading and a Top Speed for the Highest Rate at which the Web of Material Can Be Wound. A—Speed Control Unit; B—Adjustable-speed Motor; C—Speed Adjuster; D O Start-stop Push Button.

The motor can be started and stopped without interfering with the speed setting. Moreover, the speed can be changed while the motor is in operation. Quick stopping is obtained by regenerative breaking. Furthermore, no clutches of any description are needed since plenty of torque has been provided for all starting conditions.

When the work calls for operation of the motor in both forward and reverse directions a small drum-type reversing switch is used instead of the push button station.

Not only does the new drive make very slow speeds available for such operations as threading material by hand or setting up work; by the simple manipulation of a knob on the face of the speed adjuster, it is possible to obtain an almost infinite number of speeds within an overall speed range which may be as great as 12 to 1.

Reliance vs. Adjustable Speed Drive as Used With Camachine 10-6

Reliance engineers are justifiably proud of their V. S. adjustable speed drive which you have just seen demonstrated. It consists of a vertical Ball Bearing Type V.S. control unit that serves to transform alternating current to direct current in order to operate a 7½ HP Reliance D.C. motor mounted on a bracket bolted to the machine and driving directly to the machine drive gear. The control unit can be placed at any convenient point either near the machine or removed from it. The controller, the speed setting rheostat and the start-stop-inch push button station are all mounted directly on the machine at a point most convenient to the operator. Cameron Engineers are equally proud of the Camachine 10-6 with which the Reliance drive is connected.

The 62 inch wide high speed slitter demonstrated is equipped with anti-friction bearings throughout and is arranged to operate at speeds up to 1120 fpm and slit paper, cloth or fabrics of many kinds. When properly lined up and lagged on a substantial floor, speed would be 1500 fpm depending on the material to be run. Two unusual and interesting features of this machine are the provision for constant web tension control and automatic side register control.

Constant web tension control is achieved by arranging for the web of paper or cloth to pass over a floating roller. The ends of this roller are connected to levers which adjust the friction on the original roll in accordance with the pull of the web on the floating roller. When the web tends to run slack the friction is increased and vice versa. It is, of course, self-regulating and relieves the operator from the necessity to adjust the friction on the mill roll in accordance with changes in the speed of the machine or changes in diameter of the roll being unwound. This tension control roller is counter-

weighted so as to be very sensitive to any change in tension. Since uniform web tension is maintained the resulting rewound rolls are of uniform density from the core out.

The photo-electric side register control is designed to correct a dished or telescoped roll and guide it straight for slitting or rewinding within a limit of 1/32 inch on high speeds with increasing accuracy as the speed is diminished.

Side register control is important in many cases where rolls are to be rewound and slit but it is exceptionally valuable on webs that are to be printed. For that reason, this photo-electric side register control is often applied at the mill roll end of printing presses.

Experience shows that constant web tension control is essential for proper side register control, for constant web tension helps to maintain lengthwise register.

Constant web tension control equipment is often substituted on existing machines for the ordinary hand operated mill roll friction. When it is desired to install side register control equipment it becomes essential to install the constant web tension equipment also.

Three Unions Strike at Delair

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 8, 1939—Three unions went on strike today at the plant of the Kieckhefer Container Company, Delair. The unions and the company agreed that approximately 700 workers are involved and that the plant is shut down. The unions are the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers, the International Brotherhood of Firemen and Oilers, and the Pulp, Sulphite and Paper Workers International Union, all A. F. of L. affiliates.

At the teamsters' headquarters in the Labor Temple, Broadway and Royden street, it was stated that the strike resulted over the company's refusal to sign any contract. The company declined to issue any statement for the present. A mass picket line paraded in front of the plant at Derousse avenue and Pennsylvania Railroad tracks.

S. B. Clark, general superintendent of the plant, could not immediately be reached. However, W. C. Martin, yard superintendent, contacted him and announced that the company had nothing yet to say. Mr. Martin said the plant will shut down. L. J. Long, of the paper workers, and Anthony Matz of Chicago representing the firemen and oilers, indicated they would have a statement later.

IMPCO Gets Order for Mobile Mill

The Improved Paper Machinery Corporation of Nashua, N. H., has received from Hollingsworth & Whitney Company, Boston, Mass., for their new mill now under construction at Mobile, Ala., the contract for all of the pulp handling equipment between the digesters and paper machine selected from the "IMPCO" line, consisting of knotters, centrifugal screens, flat screens with bronze vats and Dunbar drive, vacuum filters, including savealls, washers, high density thickeners, lime sludge filters, black liquor washers, wet machines, deckers and Thorne Bleaching Equipment.

Philadelphia Paper Men Play Golf

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 8, 1939—In a perfect setting for any outdoor event, forty-nine members of the Philadelphia Paper and Cordage Association met on the greensward of Pine Valley Country Club on Thursday of last week, and it was the unanimous decision of all those present that Fred Brower, mill representative for Atlantic Gummed Products, is eligible to Gene Sarazen's "Hall of Fame" for golfers.

While there were forty-nine players, there were thirty-two non-players who were thrilled just following the players around for the excitement of it. Fred Marquardt won low net, which was a Lawson Little registered iron club, presented by Union Bag and Paper Company. Fred Brower won the Whiting-Patterson prize of a handsome cabinet of stationery for low score in putting contest for 18 holes. High gross was won by C. A. Wilder. The putting contest was tied betwen Lloyd Ogden and T. W. Erlichman. Low gross for 18 holes was won by M. G. Foraker, the prize being a Lawson Little registered iron club, donated by J. R. Howarth, president of the association. Bob McIntyre won a prize donated by Whiting-Patterson for low gross for 36 holes. George Phelps of J. L. N. Smythe Company, won the W. C. Hamilton prize for the most amount of par holes. The kickers' prize, a Lawson Little registered iron club, presented by Denney Tag Company, was won by Jack Weisbird. Lloyd Ogden won the low net for 36 holes.

Butler Smythe of J. L. N. Smythe Company awarded the prizes to the lucky winners after the contest on the 18th green.

The next tournament will be held on May 23 at Philadelphia Country Club's Spring Mill Course, where, by the way, the open championship of the United States will be held in June. The tournament will be in session all day, and the participants can either play 16 or 36 holes; green fees will be $2.00.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 10, 1939—The Government Printing Office has received the following bids for 15,600 pounds (200,000 sheets) of 75 per cent rag, 24 x 38 lithograph finish map paper: Paper Corp. of U. S., 13.57 cents; Mathers-Lamm Paper Company, 11.87 cents; Mudge Paper Company, 11.81 cents; Butler Paper Company, 12.01 cents; Barton, Duer & Koch Paper Company, 12.05 cents; R. P. Andrews Paper Company, 12.03 cents; Stanford Paper Company, 11.85 cents; Old Dominion Paper Company, 12.189 cents; and Walker, Goulard Plehn Company, 12.65 cents.

For 10.000 pounds of 22½ x 28½ green calendered tag board: Barton, Duer & Koch Paper Company, 7.9 cents.

For 970 pounds (5,000 sheets) of 21 x 32½ buff sulphite index paper: Whitaker Paper Company, 9.23 cents; and Barton, Duer & Koch Paper Company, 7.98 cents.

For 120,000 pounds of newsprint paper in 36 inch rolls: National Pulp and Paper Company, Inc., 2.425 cents; Paper Corporation of U. S., 2.95 cents; Barton, Duer & Koch Paper Company, 2.98 cents; and Old Dominion Paper Company, 2.989 cents.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Cleveland, Ohio—The Hankins Container Company, 3044 West 106th street, manufacturer of corrugated fiber boxes and containers, has approved plans for new addition to plant, consisting of a two-story structure of about 40,000 square feet of floor space. It will be equipped for considerable increase in present capacity. Erection contract has been awarded to Gillmore-Carmichael-Olson Company, 1983 East 53rd street, Cleveland, and work will be placed under way at once. Cost estimated close to $75,000, with equipment.

East Walpole, Mass.—Bird & Son, Inc., manufacturer of roofing and building papers, wall board, etc., has awarded general contract to Vappi & Co., 240 Sidney street, Cambridge, Mass., for one-story addition, about 60 x 80 feet, for storage and distribution. Erection is scheduled to begin at once. No estimate of cost announced. Company also has work under way on new addition to branch plant at 1472 West 76th street, Chicago, Ill., previously referred to in these columns, consisting of a one-story structure, 93 x 305 feet, to be used in part for storage and distributing service. It is estimated to cost about $65,000 with equipment, and will be completed early in the summer. The Welso Construction Company, 2233 West Grand avenue, Chicago, has the general erection contract.

Madison, Wis.—The Celon Company, 2034 Pennsylvania avenue, Joseph C. Ford, president, has preliminary plans under consideration for erection of new local plant for the production of cellulose products, including pressed cellulose specialties. It will be one-story type, reported to cost over $40,000, including equipment.

Mobile, Ala.—The Hollingsworth & Whitney Company, 140 Federal street, Boston, Mass., manufacturer of bond and other writing paper stocks, kraft and fiber papers, etc., has completed final plans for new pulp and paper mill at Mobile, where tract of more than 200 acres of land was acquired from the Alabama State Docks Commission several months ago, as previously mentioned in these columns. Erection contract for new mill has just been let to the Rust Engineering Company, Clark Building, Pittsburgh, Pa., and work on foundations is scheduled to be placed under way at once. Plant will consist of several large and one multi-story buildings for pulp and paper-making departments, with other units for storage and distribution, power house, pumping station and miscellaneous mechanical departments. Plant will be used for kraft paper production and will have facilities for employment of about 1000 persons. Company has a waterfront site on Mobile River and Chickasabogue Creek. Cost of new mill is estimated at $5,000,000 and is expected to be completed in spring of 1940.

Binghamton, N. Y.—The Cafferty Carton Corporation, recently organized with capital of 150 shares of stock, plans operation of local plant for the manufacture of a line of paper boxes and containers. Production is scheduled to begin soon. New company is represented by Jenkins, Deyo & Hitchcock, Security Mutual Building, Binghamton, attorneys.

Franklin, Va.—The Chesapeake-Camp Corporation, manufacturer of kraft paper products, has awarded general contract to the Turner Construction Company, Norfolk, Va., for new one-story addition, to be used for expansion in pulp mill. It is reported to cost close to $45,000, including equipment. Erection will be placed under way at once.

Manitowoc, Wis.—The Kieckhefer Container Company, 1715 West Canal street, Milwaukee, manufacturer of corrugated boxes and containers, is awarding miscellaneous contracts for work and equipment for new mill on South 18th street, near Dewey street, lately noted in these columns. An award for an oil-fired boiler unit and accessories has been made to the Cleaver-Brooks Company, Milwaukee; and contract for other power equipment will be made soon. Heating, plumbing and electrical installations will be carried out by the Hamann Construction Company, North Eighth and Reed streets, which has the general erection contract, and will be sub-let by that company. Plant will total about 70,000 square feet of floor space, and is reported to cost close to $150,000, with equipment.

Newark, N. J.—Fire recently damaged a three-story building on Nesbitt street, near Orange street, used by John H. Carlos & Sons, Inc., 26 Kitchell street, paper mill supplies, for paper storage and distributing service. The main portion of building, 60 x 200 feet, was severely damaged. Loss reported close to $25,000.

Brooklyn, N. Y.—The Rapid Cutting Company, Inc., 169 Franklin avenue, paper and card stocks, has filed plans for a three-story addition, 69 x 105 feet, on adjoining site, for which superstructure will be placed under way at early date. Large increased capacity will be carried out. Cost reported over $40,000, including equipment. S. Walter Katz, 527 Fifth avenue, New York, N. Y., is architect.

New York, N. Y.—The Interstate Paper Products Company, Inc., which recently leased a floor in building at 521 West Twenty-third street, as noted in these columns, is a new company, organized with capital of 200 shares of stock, no par value. It will specialize in the production of paper napkins and al-

SPEAKING OF STREAKING

Here's a common cause of color streaks and wet spots and a sure-fire way to cure it.

• • •

If doctors can score your top press rolls, or wear them unevenly, streaks and wet spots are sure to follow. Other mills have cured this problem with STONITE* Top Press Rolls. STONITE,* a patented compound, is the only roll covering made of granulated stone and ebonite. It has rock-like hardness with maximum resistance to wear and to doctor scoring. This same hardness results in longer life with infrequent grinding. STONITE* Rolls won't chip and are guaranteed not to crack.

If you're troubled with streaking, look into STONITE* Rolls. STONITE* not only solves that problem but gives you improved surface finish plus greatly reduced pick-ups and number of breaks. It insures greater safety and efficiency and helps you make better paper with less trouble and at lower cost.

• • •

There are more than 1700 Stonite Rolls in service in 31 countries throughout the World. May we tell you what they are doing under conditions exactly like yours?

STONITE* Rolls

TOP PRESS AND SMOOTHING

★ *(Ebonite and Granulated Stone Composite U. S. Patent 1,787,890 Re. 18,111)*

STOWE-WOODWARD, INC. NEWTON UPPER FALLS · MASS.

NEW YORK OFFICE · WOOLWORTH BLDG.

Stowe-Woodward Rolls are made on the West Coast by HUNTINGTON RUBBER MILLS, INC., Seattle, Washington

Makers of WHITE STAR *Rubber Covered Rolls,* TANNITE *Couch Rolls* STONITE *Top Press and Smoothing Rolls—All by the* COREWELD *Process*

lied paper goods, providing a converting plant for this purpose at location mentioned.

Dayton, Ohio—The Reynolds & Reynolds Company, Washington and Dudley streets, manufacturer of paper specialties, has taken out a permit for expansion at plant, previously referred to in these columns and on which work is being placed under way. The program consists of remodeling a former power house building and converting for plant service, primarily for use as a storage and distributing unit. Work will be pushed to early completion, and is reported to cost close to $75,000, in conjunction with other improvements at plant. Kauffman & Merrell, Dayton, are general contractors.

Melbourne, Australia—Zig Zag (N. Z.), Pty., Melbourne, Victoria, recently organized, has plans under way for the early construction of a new mill in New Zealand for the manufacture of cigarette paper. It will comprise a main one-story unit, with several auxiliary structures, reported to cost over $100,000, with machinery.

New Norfolk, Tasmania—The Australian Newsprint Mills, Pty., Ltd., has work under way on new local mill for the production of newsprint and is placing orders for primary machinery to be installed in the plant. It will consist of several large one and multi-story units, with power house, storage and distributing buildings, shops and miscellaneous structures. The initial paper-making machine will have a rating of about 27,000 tons per annum, and other machines of similar capacity will be installed in the future. Company has contracted for hydroelectric power supply for plant, and will provide a large power substation on mill site to handle this service. Plant is scheduled for completion in the summer of 1940, and will represent an initial investment of about $10,000,000, which will be increased to about $20,000,000 at a later date, when mill capacity is developed to about 100,000 tons of newsprint per annum, as now proposed.

Indianapolis Demand Improves

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., May 8, 1939—Considerably better weather during the last week seemed to have a good effect on paper demand in this section. It put the general public in a better frame of mind. Fine paper demand, while not all it should be, expanded slightly with some buying for books, covers and ledgers reported. Local jobbers believe this is the turning point they have been looking for. At that, volume for the year to date has been ahead of the same time a year ago.

Demand for all building paper and roofing has gone up by leaps and bounds since the first of the year and there appears to be no indication of any decline during the remainder of the summer and fall. Business is so much better than it was a year ago there is hardly a comparison. The demand is well balanced between the industrial cities and rural communities. It is predicted it will take ten years of intensive building to catch up with the housing shortage that developed during the lean years. Most of the construction is being financed through FHA loans.

Manufacturers report a good demand for waxed papers and local jobbers say cellophanes also are improving. The entire price structure is being maintained in these and other lines and credit conditions are reported to be improving.

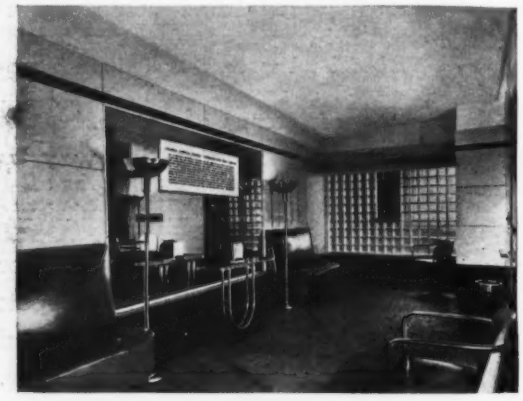
Container manufacturers have increased their production to some extent. Some of the added production is being used to build up warehouse stocks that have been permitted to drop almost to the vanishing point. A big increase is reported from the ice cream trade, whose volume will equal, if not better than last year. Tissues also are moving nicely. Summer specialties have been having a good demand.

Wrapping papers and bags showed improvement during the week. Paper converters for the box trade say their business is better than last year.

Paper stock executives report a slightly better mill demand for both better grades of rags and paper. Poorer qualities are not so much in demand. Paying prices remained the same during the week.

Pittsburgh Glass in Columbia Alkali Plant

The accompanying photograph shows a portion of the new reception room in the recently completed office building in the Barberton plant of the Columbia Chemical Division, Pittsburgh Plate Glass Company. The walls are covered with gray carrara glass,



VIEW IN COLUMBIA ALKALI PLANT

trimmed in maroon carrara glass, manufactured by the Pittsburgh Plate Glass Company. The glass blocks are those produced by the Pittsburgh Corning Company, which permit plenty of light to enter the lobby.

Etched on a separate piece of glass which is placed against the large mirror, is an inscription which in tabloid form tells of the growth and purpose of the Columbia Chemical Division.

American Coating Mills Joins TAPPI

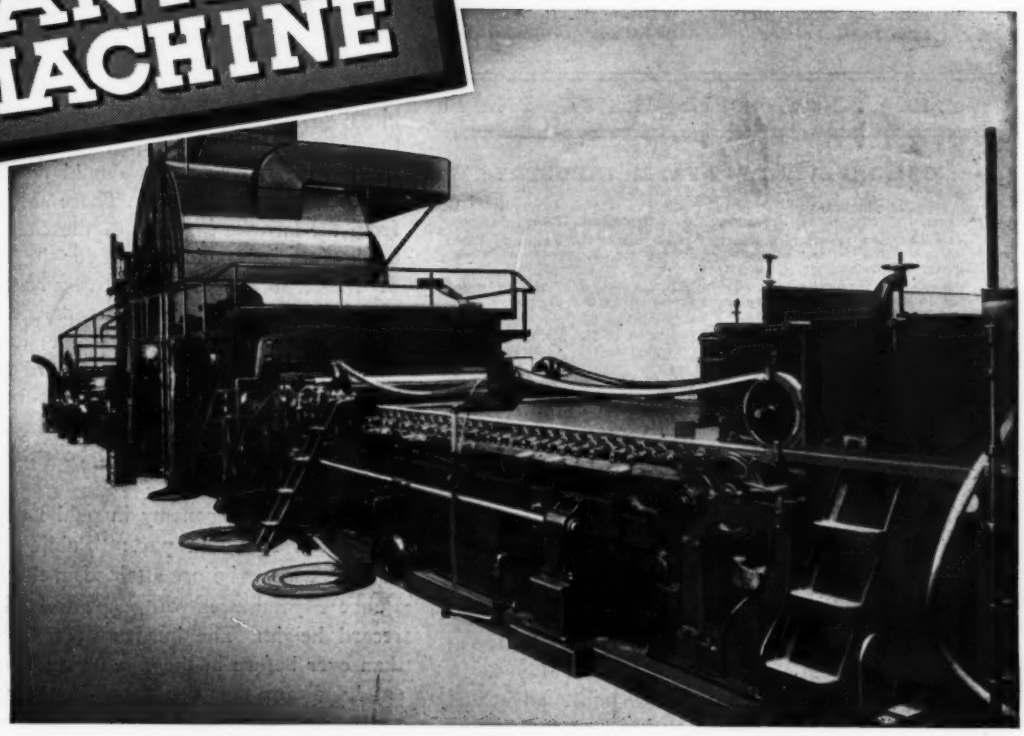
The executive committee of the Technical Association of the Pulp and Paper Industry announce the admission of the American Coating Mills, Elkhart, Ind., as a corporate member.

The American Coating Mills manufacture clay coated folding box boards and patent coated board, with a daily capacity of 200,000 pounds per 24 hours.

C. C. Colbert, chairman, R. L. Snideman, president, L. C. Daly, vice president and general manager and C. W. Dunnington, secretary-treasurer, are the officers of the company.

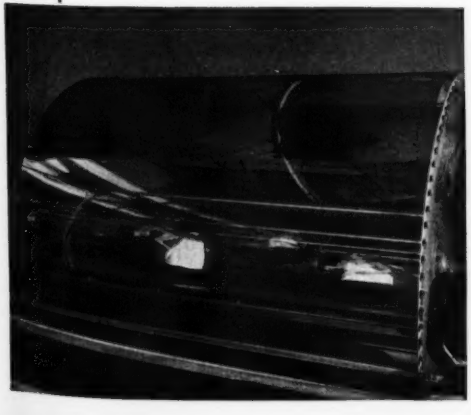
R. J. Stephenson, chief chemist, is the official representative of the company in the Technical Association.

THE Beloit YANKEE MACHINE



● **The Beloit Yankee Machine furnishes an economical easy means of diversification. No other machine has the all-around adaptability to fit the needs of mills making specialty papers, both light and heavy weights.**

The machine is provided with all the latest features: Removable Fourdrinier ...High Speed Super Shake...Suction Rolls...High Pressure Dryer...Hypoid Drive, etc.



Beloit has developed a special alloy metal and special grinding and polishing process to produce the close grained, hard mirror finish shown in this photograph. This is a result of Beloit's many years of experience in building practically all the Yankee machines in this country.

Beloit has also recently developed a high pressure Yankee dryer to meet the demand for maximum production.

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PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Vol. 108 New York, May 11, 1939 No. 19

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Syracuse Hotel, Syracuse, N. Y., September 12-14.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Convention, Wardman Park Hotel, Washington, D. C. June 13-15.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Atlantic City, N. J. October 16-20.

REMOVE BUSINESS CURBS

Practical suggestions for a permanent business recovery were included in the resolutions adopted by the Chamber of Commerce of the United States at its annual convention in Washington on May 4. In its comprehensive program the Chamber advocated repeal of the Wages and Hours Law, amendment of the National Labor Relations Act, drastic curtailment of government expenditures and thorough revision of Federal tax laws. All of these recommendations are eminently practical and are rightly started as the key of business recovery.

In reference to relief expenditures the resolutions said in part: "Industry indorses the principle of Federal financial assistance in necessary relief expenditures. Such expenditures should not only accomplish the objective of relief, but should serve as a contributing factor to employment in private enterprise. The record attests that the program of the Works Progress Administration and its predecessors has not reduced unemployment. Its expenditures have been a major contributing factor in the mounting government deficit. Recovery and thus employment in private enterprise largely depend upon restoration of confidence in government financing."

In recommending repeal of the Wages and Hours Act the resolutions stated: "The experiences with the Wage-Hour Act have demonstrated the impracticability of such a measure in its application to widely varying conditions. The difficulties and hardships caused by the law will increase. The law should be repealed for the benefit of employers, employees and the general public."

Amendment of the National Labor Relations Act as adopted was as follows: "Without more delay, the Labor Relations Act should be structurally amended. There should be specific provision for preservation of the right of free speech, both for the employer and for the employee. Frequently an employer has been helpless between contending organizations. An employer should be given an express right to have the board determine by secret ballot of employees the representation with which he is to deal. For employees' freedom of choice in selecting representatives there should be complete protection. Employees in exercising their rights should not be exposed to coercion from any source. There should be removed from the law the sanction of the closed shop, which the law not only indorses but for the accomplishment of which it provides effective procedure. As the board itself has not clearly separated its activities as prosecutor, investigator and judge, Congress should provide for use by the board of independent examiners to hold hearings for fact-finding purposes. All the board's findings as to facts and all its decisions as to the law should be subject to judicial review."

In advocating economy in public expenditures the resolutions stated in part: "Public indebtedness is at a peak never before attained in the United States. Public expenditures within the United States are at record height. The burden of taxation is heavier than ever before in the country's history. The present handicaps that result are so strongly deterrents against the economic recovery necessary for the public interest that the country should concentrate its attention upon expenditures by every form of public agency, Federal, State and local, and insist upon reduction of totals within the amount the country can currently afford. Too heavy a mortgage has already been placed upon future generations of the American people. There should be made available to all citizens complete information about public finances. . . . Every business man should support these principles."

In urging the revision of Federal taxes the Chamber said in part: "In the interest of revenues for the government as well as economic progress the Revenue Act should be thoroughly revised. There should be immediate modification of those taxes, which, because of excessive rates or because of their hampering effects, are now acting as deterrents to business recovery. There should be elimination of punitive features and of all provisions other than those which have for their purpose the raising of revenue. The objects should be: Enactment of a fair, equitable revenue law, designed to endure for a period of years, and thus to remove the uncertainties caused by frequently changing tax rates and pro-

visions; reasonable provision for carrying operating losses forward to succeeding years; more equitable treatment of capital gains and losses; modification of the individual surtaxes, to the end that government revenues may be increased and the present discouragement to individual enterprise and initiative diminished.

In advocating changes in the old-age pension system, the Chamber recommended in part that, "The financing of the old-age insurance system should be definitely and permanently changed from a reserve basis to a basis for provision each year to meet the obligations maturing in the year. This means that the rates of tax for employees and employers will be so set as to bring in only enough to pay current benefits and build up a contingent reserve against periods of temporary depression."

Senator Harrison, Chairman of the Finance Committee, in speaking at the final dinner of the convention expressed the opinion that, while any substantial relief from taxes could not be expected until Federal expenditures had been brought down from their present high peak, said: "I hope and believe that before the Congress adjourns we will have written corporate tax provisions that will encourage private industry to increase employment, add to the purchasing power of the people and stabilize the revenues to the government."

Will Desist from Misleading Statements

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 8, 1939—Engaged in the manufacture and sale of envelopes, Continental Envelope Corporation, 429 South Ashland Boulevard, Chicago, has entered into a stipulation with the Federal Trade Commission to discontinue misleading representations.

The respondent corporation agrees to desist from representing in its advertisements or otherwise that it produces over 1,000,000 envelopes a day or over 300,000,000 a year, or any other statements concerning its production which do not truthfully and accurately represent the actual output.

It will also cease representing in advertising matter or in any other way that purchasers of its products "save up to 30 per cent", implying that the respondent's prices are up to 30 per cent less than prevailing prices or the prices charged or discounts allowed by competitors, when such is not a fact.

Albert Fox Heads Southwestern Div.

[FROM OUR REGULAR CORRESPONDENT]

DALLAS, Tex., April 22, 1939—Albert Fox of Shreveport, La., was elected president of the Southwestern Paper Merchants Association at the concluding session of the annual spring meeting at the Baker Hotel last week. He succeeds Robert M. Olmsted of Dallas.

Other new officers are J. Thomas Wells of Dallas, vice-president of the coarse paper division; Stewart R. Rivers of Dallas, vice-president of the fine paper division; Ralph Moser of Fort Worth, secretary, and Roy Kerr of Amarillo, treasurer.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1939	1938	1937	1936	1935	1934
January	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	81.8%	68.7%	90.1%	77.9%	70.0%	.....
March	84.1%	69.6%	90.3%	76.0%	70.5%	.....
April	82.5%	68.3%	92.1%	82.3%	70.0%	.....
May	.....	69.0%	90.6%	81.6%	69.4%	.....
June	.....	66.0%	87.3%	80.7%	72.3%	.....
July	.....	72.0%	81.8%	77.3%	64.9%	.....
August	.....	77.2%	82.9%	81.5%	70.9%	.....
September	.....	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	72.3%	80.6%	81.3%	70.5%	.....
First 17 weeks	81.6%	67.7%	90.7%	78.2%	68.9%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1939		CORRESPONDING WEEKS, 1938	
March 25	84.0%	March 26	68.5%
April 1	86.2%	April 2	72.3%
April 8	83.9%	April 9	67.3%
April 15	81.2%	April 16	68.0%
April 22	82.2%	April 23	67.4%
April 29	82.9%	April 30	70.4%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Mar. 25, 1939	Apr. 1, 1939	Apr. 8, 1939	Apr. 15, 1939	Apr. 22, 1939	Apr. 29, 1939
0% to 50%	57	51	53	53	53	43
51% to 100%	248	254	248	245	228	161
Total Mills Reporting	305	305	301	298	281	204

PAPERBOARD OPERATING RATIOS

Per cent of operation based on "Inch-Hours" reported to the National Paperboard Association:

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1935	62%	68%	68%	63%	61%	66%	62%
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	....	....	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1935	67%	71%	77%	71%	61%	66%
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%

Week end. Mar. 25, 1939—73% Week end. Apr. 15, 1939—67%
Week end. Apr. 1, 1939—74% Week end. Apr. 22, 1939—69%
Week end. Apr. 8, 1939—71% Week end. Apr. 29, 1939—68%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

Passes Stream Pollution Bill

WASHINGTON, D. C., May 10, 1939—The Senate last week passed the so-called stream pollution bill in which the paper industry has been considerably interested during the past two sessions of Congress.

The bill as passed by the Senate authorizes an appropriation of $700,000 a year beginning in 1940 to States for water pollution control studies and surveys and would permit States to enter into stream pollution control compacts. The bill was sponsored by Senator Barkley, the Majority Leader of the Upper House, and it establishes a division of water pollution control in charge of the Public Health Service, and provides for Federal loans and grants-in-aid for river and stream pollution.

The bill was passed after the Senate had defeated an amendment offered as a substitute by Senator Clark of Missouri which would have given the Army Board of Engineers greater authority over the program.

A section of the analytical laboratory, one of the many divisions that make the Stamford Research Laboratories of the American Cyanamid Company valuable to the industries using chemicals.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of Paper Industry Literature

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Lignin

Method for Studying the Decomposition of Isolated Lignin and the Influence of Lignin on Cellulose Decomposition. S. A. Waksman and T. C. Cordon. Soil Science 45:199-206 (1938).—A new method, based on the solubility of certain forms of lignin in alcohol, is proposed for the study of decomposition of lignin by micro-organisms. The lignin is incorporated with cellulose fibers and the cellulose-lignin mixture is used as a source of lignin. This preparation was decomposed by different organisms, but the lignin decomposed at a much slower rate than the cellulose. Lignin admixed with cellulose had no injurious effect on the decomposition of the latter. In natural plant materials, however, especially wood, lignin has a marked retarding effect on cellulose decomposition. When the lignin is removed, the rate of cellulose decomposition increases but the presence of only 8 per cent of lignin was found to be sufficient to reduce the rate of cellulose decomposition by 50 per cent. A reduction of the lignin concentration to 1.5 per cent enables the cellulose to decompose as readily as in the pure form. The depressing effect of lignin on cellulose decomposition in plant residues cannot, therefore, be considered to be due to the presence of lignin as such, but must be due to the manner of combination with cellulose which protects the latter from rapid attack by saprophytic micro-organisms.—A.P.-C.

Reaction of Hardwood Lignin with Hydrogen. Elwin E. Harris, James d'Ianni and Homer Adkins. J. Am. Chem. Soc. 60:1467-1470 (June 1938).—Lignin, extracted from aspen and dissolved in dioxane, reacted with hydrogen so that one mole was taken up by 25 g. of lignin. The four following products were isolated and identified: methanol, 4-*n*-propylcyclohexanol-1, 4-*n*-propylcyclohexanediol-1,2, and 3-(4-hydroxycycloheyxl)-propanol-1. The weight of methanol isolated and the combined weight of the 3 nine-carbon-atom compounds identified were about 28 per cent and 44 per cent, respectively of the weight of the lignin submitted to hydrogenation. The highest yields previously reported from a hardwood lignin by any treatment were 4 per cent for methanol and 9.5 per cent of aromatic compounds isolated after methylation. It is shown that there are units of 15 or more carbon atoms in the higher boiling products. These products appear to be hydroxy saturated ethers.—A.P.-C.

Lignin. XI. The Action of Amidosulfonic Acid. Hermann Friese and Horst Ademeit. Ber. 71, no. 6:1307-1312 (June 8, 1938); B. I. P. C. 8:424.—Unlike the action of a mixture of acetic anhydride, glacial acetic acid, and sulfuric acid on pine wood, whereby the wood is completely dissolved, amidosulfonic acid, when used in place of sulfuric acid, dissolves only a part of the wood. The lignin is not sulfonated, which indicates that it is not aromatic in character. No definite product is isolated, either from the dissolved part or from the hydrolyzed residue.

Origin and Mechanism of Adhesion in Wood Plastics. A. J. Bailey. Modern Plastics 15, no. 11:39-40, 66 (July, 1938); B. I. P. C. 8:469.—The removal of cellulose with cellulose solvents or of lignin with lignin solvents from thin sections of commercial boards and pressed sheets revealed that the cellulose furnishes the strength and adhesion and the lignin functions largely as a filler. Increasing the pressure from 500 to 4500 pounds per square inch produced little difference in the final properties of boards prepared from sulfite pulp and sheets of paper toweling. The bonding force is held to be the cellulose-cellulose cohesion. Process tending to increase the external cellulose surface would develop bonding capacity and contribute to higher strength.—C.J.W.

Molded Articles from Lignin. I. P. Losev, V. S. Kaminskii and S. V. Shiskin. Org. Chem. Ind. (U.S. S.R. 4:620-626 (1937); C. A. 32:5958—Hard, dense molded products were obtained from acid-treated sawdust with about 47 per cent lignin content on the addition of 3 per cent calcium oxide, 3.5 per cent calcium hydroxide and 8 per cent of furfural and aniline by the method of the Forest Products Laboratory, Madison, Wis. The pressed moldings showed good resistance to water and even to 25 per cent sulfuric acid.—C.J.W.

Vanillin from Lignin Offered Commercially. Oil Paint Drug Reptr. 133, no. 26:46 (June 27, 1938); B. I. P. C. 8:423.—Vanillin manufactured by a single step process from lignin obtained from spruce and other coniferous trees is offered by the manufacturer, the Salvo Chemical Corporation of Rothschild, Wis. The plant has a capacity sufficient to supply the entire requirements of the United States. Using the Marathon-Howard process and starting with the waste liquor from pulp manufacture, a pure lignin is separated highly suitable for economic processing. The vanillin obtained is a pure white needle crystal, and chemically, consists of a protocatechuic aldehyde 3-methyl ether.—C.J.W.

Alkaline Process

Alkaline Decomposition of Deciduous Woods

and Wood Substitution Materials. E. Wedekind, H. Grasshof and O. Muller. Papier-Fabr. 35, no. 51: 513-16 (Dec. 17, 1937).—The author describes in detail, the cooking procedure, the bleaching and the properties of the resulting pulp. The raw material used being beech wood, eucalyptus, oak, and waste from flax and hemp manufacturing processes.—J.F.O.

The Chlorination of Plant Substances. O. Muller and F. Stalder. Papier-Fabr. 36, no. 10:81-88; no. 11:89-93 (March 4, 11, 1938).—The action of chlorine and hydrochloric acid on the single constituents of wood, especially on carbohydrates and its humines, as well as on lignin, are investigated, with special reference to the existing chlorine consumption and the resulting products. Several reactions with wood during the chlorination are discussed, and numerous mention of the literature is resorted to. The article is divided into the chemistry of the reactions, the formation of chlorine derivatives, the formation of hydrochloric acid, the action of hydrochloric acid on carbohydrates and the chlorination of the reaction products occurring during the acidification of the carbohydrates. Numerous tables of data accompanies the article.—J.F.O.

Pine Wood, Sulphate Pulp and its Bleaching. W. Schmid. Papier-Fabr. 36, no. 10:137-38 (March 4, 1938).—The bleaching of sulphate pulp is only possible by the multistage methods, the first being the so-called chlorination with elementary chlorine, washing, treatment with alkali, washing and then the bleaching with calcium hypochlorite. The author discusses the problem as to whether the bleaching action should take place with stirring and circulation or should this costly procedure be dispensed with.—J.F.O.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has approved the election to membership of the following:

Anthony J. Bruno, Jr., chemical engineer, Agricultural By-Products Laboratory, Iowa State College, Ames, Iowa, was formerly with Valentine Sugars.

John Fletcher, research chemist, Flood & Conklin Company, Newark, N. J., is a graduate of Pratt Institute. He was formerly with the Interchemical Corporation, Plantergon Wall Board Company, National Gypsum Company and the Glidden Company.

William E. Gay, chemist, Harding-Jones Paper Company, Excello, Ohio, was educated at Emory University and has been with Harding-Jones about 2 years.

Russell M. Pickens, technical director, Rayonier Incorporated, Shelton, Wash., was with duPont Rayon and Cellophane Companies for 5 years. He has been with Rayonier for 9 years. In 1925, he received his doctor of philosophy degree in chemistry from Iowa State College.

George T. Hollrock, paper technologist, R. T. Vanderbilt Company, East Norwalk, Conn., was formerly with Gaylord Container Company and Union Bag and Paper Corporation. He received his education at the New York State College of Forestry.

Ray A. Olson, laboratory technician, Bryant Paper Company, Kalamazoo, Mich., was graduated from Bowdoin College.

Freeman W. Elliott, chief chemist, Howard Smith Paper Mills, Ltd., Cornwall, Ont., is a graduate of Queens University. He was formerly with J. T. Donald & Co. and has been with his present company for over 12 years.

James McCalmont, chemist, A. M. Collins Manufacturing Company, Philadelphia, Pa., was formerly with Dill & Collins, Inc., for over 9 years. He was educated at Drexel Institute.

Emery L. Walker, vice president, Kieckhefer Container Company, Eddy Paper Corporation and North Carolina Pulp Company, Milwaukee, Wis., was formerly with the Baltimore Locomotive Works, Carnation Milk Company and Hale & Kilbourn. He has been with Kieckhefer Container Company and subsidiaries for 24 years. Mr. Walker is a graduate mechanical engineer of Cornell University.

Roy P. Whitney, director, Bangor Station, Massachusetts Institute of Technology, School of Chemical Engineering Practice, Bangor, Me., received his B.S. and S. M. degrees from M.I.T.

Gordon C. Thomas, development engineer, the Lummus Company, Bayonne, N. J., is a graduate of Massachusetts Institute of Technology and was formerly with the Riegel Paper Corporation.

Richard G. Knechtges, assistant sulphite superintendent, Northern Paper Mills, Green Bay, Wis., was formerly with Forest Products Laboratory and Longview Fibre Company. He is a graduate of the University of Wisconsin.

William Beckett, treasurer, Beckett Paper Company, Hamilton, Ohio, received his education at Tufts College and the Massachusetts Institute of Technology. He was formerly with Chatfield Paper Company and has been treasurer of the Beckett Paper Company for six years.

E. Bennett Beede, pulp and paper engineer, Foxboro Company, Atlanta, Ga., was formerly mechanical engineer for Franklin Rayon Corporation and received his S.B. degree from the Massachusetts Institute of Technology.

Gerard L. Larocque, chemist, Rolland Paper Company, St. Jerome, Que., was formerly with the Department of Agriculture, Canadian International Paper Company, McGill University, Canadian Pulp and Paper Association and Forest Products Laboratories. He received his Ph.D. degree from McGill University and has written several scientific papers.

Harold F. Cotter, assistant professor of pulp and paper, School of Chemistry, University of Alabama, Tuscaloosa, Ala., received his S.B. and S.M. degrees from Massachusetts Institute of Technology. He was formerly with Penobscot Chemical Fibre Company, International Paper Company and Sturtevant Mill Company.

Neil H. Christian, superintendent of sulphate mill, Nekoosa-Edwards Paper Company, Port Edwards, Wis., was formerly with the Munising Paper Company and the Consolidated Water Power and Paper Company. He has been with Nekoosa-Edwards over 13 years.

Ellsworth E. Kimmel, student, Ohio State University, Columbus, Ohio, will graduate in June 1939 in chemical engineering.

Norman O. Seagrave, sales manager, Port Huron Sulphite and Paper Company, Port Huron, Mich., war formerly with the Continental Motors, Burroughs Adding Machine Company, Fisher Body Company, Detroit Edison Company, Seagrave-Lougheed Company and Seagrave & Son, Inc. He is a graduate of the University of Detroit.

Refining of Pulp*

By L. Rys[1] and A. Bonisch[2]

Abstract

The object of this work was to obtain an orientation of the important processes of the pulp refining. In the hot refining process it is important that the raw material has sufficient resistance to alkali otherwise an insufficient alpha content will be obtained with a high loss in material. Higher temperature, stronger liquor and longer reaction time give higher alpha content. The highest limit of the alpha content obtainable by the hot refining is about 96.5 per cent. Intensified treatment methods led to no further increase in alpha and gave greater material losses. Chlorination before as well as hypochlorite after bleach after the extraction give a slight alpha increase. Acid treatment after the after bleach in order to lower the ash content does not influence the alpha content. Na_2S and Na_2SO_3 as additions to the extraction liquor give better yields and somewhat lower alpha content. Additions which have an oxidative reaction lower the viscosity; the yield and alpha content are also slightly lowered.

The amount of ash is dependent on the acid after treatment and the water quality. In the cold refining, it is an advantage to proceed from a fully bleached material. Degraded raw material with low alpha content gives a low alpha content after the refining. Unbleached pulps are only bleached to a pure white with difficulty after cold refining. Strong liquors give higher alpha values. The highest value to be reached by the cold refining process is around 98.5 per cent alpha content. Higher stock consistencies give, under similar conditions, lower alpha content. Pretreatment with nitric acid before the refining is beneficial to both the alpha content and the color. Oxidative additions operate as viscosity lowering agents. Again it is mentioned that the alpha content, the copper number and the viscosity give no general valid conclusions of the actual purity or refining degree. It seems necessary, therefore, to draw up and perfect further testing methods.

Introduction

The refining of pulps has occupied much space in the patent literature of the last few years, yet in the technical writings exact data as to the true reactions of the refining are missing. This is true of cold refining as well as hot refining. Therefore, a groundwork for further research in this direction is lacking. Apart from the few dissertations which have appeared here and there in the technical papers, the excellent work of G. Jayme *(1)* can be considered the first organized step in this field. Jayme has quite rightly divided the refining methods into cold and hot methods which can be designated also as mercerization and extraction methods. In a later paper Jayme in conjunction with K. Steigman *(2)* has investigated especially the swelling properties of refined pulps made by both methods. Although this work is a great enrichment of this field, it must be admitted that the pulps used for these experiments produced final products which were not particularly suitable. This was because pulp Type A used for the hot refining and pulp Type B used for cold refining were not especially suitable. The results obtained by Jayme confirm clearly our determinations, namely, that a low alpha cellulose content in the original material leads likewise to a low alpha cellulose content in the refined material. Further, that a certain fiber stability is indispensable for the hot refining. Therefore, a partly bleached pulp (chlorinated) is a better raw material than a fully bleached pulp. On the contrary a definite freedom from incrustants is of especial importance in the cold refining. It should be mentioned here that the present methods of analysis do not yet allow the absolute estimation of what actually influences the degree of pureness. It can easily happen that a pulp with 99 per cent alpha cellulose content is less pure than one which has been refined to only 96 per cent alpha cellulose content. We could not, therefore, follow in stages the true degree of purity in the experiments given below which would have been the ideal condition. Our work will offer, however, only a general view of the main process of the refining of sulphite pulp and serve as a groundwork for further special research. In the carrying out of the experiments, the following work plan was drawn up.

A. Refining by the hot process (extraction).
1. The pretreatment of the pulp.
2. The influence of liquor concentration.
3. The influence of time.
4. The influence of temperature.
5. The influence of stock concentration.
6. The influence of double extraction.
7. The influence of intermediate treatments.
8. The influence of various additions to the NaOH extraction.
9. The replacement of NaOH by other bases.
10. The factors controlling the viscosity.
11. The after treatment.

B. Refining by the cold process (mercerization).
1. The pretreatment of the pulp.
2. The influence of liquor concentration.
3. The influence of time.
4. The influence of temperature.
5. The influence of stock concentration.
6. The influence of various additions in the mercerization.
7. The factors controlling the viscosity.
8. The after treatment.

Hot Refining Process

Under the hot refining process it is understood that it covers those refining methods by which the pulp is treated with proportionately weak alkaline solutions at higher temperatures under atmospheric or higher pressures. Two processes take place here in parallel. These are:

1. The dissolving out of the non-cellulosic portions and the cellulosic impurities, (hemicelluloses).
2. Destruction and/or degradation of the cellulose.

According to the nature and manner of the extraction employed and to the choice of the raw material, various degrees of alpha content and yield are consequently obtained. The solubility of cellulose in hot

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* Translated by T. W. Toovey, Pennsylvania Salt Mfg. Company, Philadelphia, Pa.

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[2] Chemist, Harmanetzer Papierfabrik, Harmanec, Czechoslovakia.

The authors wish to thank here Mr. T. W. Toovey who assisted in carrying out experiments and analyses.

caustic soda liquor has been known for a long time and the great importance due to it has already been established by Tauss *(3)*. Table I gives the results obtained by Tauss in his experiments with Swedish filter paper.

TABLE I

Concentration of NaOH Solution per cent	Time of Treatment Hours	Pressure Atm.	Cellulose Dissolved per cent
4	3	—	12.07
8	3	—	12.99
8	6	—	21.86
8	9	—	22.79
8		5	58.02
10		10	58.99

It is obvious from these figures that the concentration of the caustic liquor and the pressure as well as the time have an influence on the degradation of the cellulose, that is, the solubility.

1. Pretreatment

As already mentioned, every pulp is not suitable for hot refining. It is, therefore, necessary in order to obtain a suitable end product that an appropriate raw material be chosen. Care must have been previously taken in the cellulose cooking so that a well cooked pulp, not too hard and yet not overcooked is obtained. As a proper pretreatment, apart from a thorough washing after screening, the prebleach is important. This is best carried out in the form of a chlorination. On the other hand the removal of the lignin by chlorination can be considered as a refining procedure. This removal of lignin has little or no effect on the increase in alpha cellulose content, yet it is evident that the removal of lignin has an effect on the increase of the alpha content after the true extraction. The full effect of the degree of lignin removal shows itself first at the end of the final bleach when the samples are taken to the same degree of whiteness. Table II gives some figures showing the influence of lower lignin content due to a pretreatment with chlorine on the alkali extraction. The extraction was carried out in a water bath with 1 per cent caustic soda solution and at 5 per cent consistency for 1 hour using a reflux condenser. These experiments show that the chlorinated raw material gives a higher alpha cellulose content after

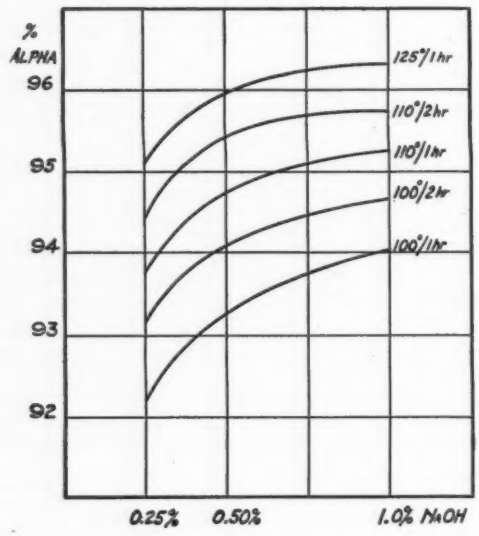

Fig. 1.

TABLE II

Alpha Content after	Cellulose without Pretreatment	Cellulose Chlorinated with about 70 per cent Alpha Cellulose, per cent	Cellulose Chlorinated with Excess
With treatment....	88.32	88.32	88.32
Chlorination	—	88.84	88.95
Extraction	91.32	92.43	92.53
Final bleach.....	90.45	92.50	92.60
Chlorine used in final bleach.....	2.3	0.4	0.35

the final bleach and that there is no reduction of the alpha content in the final bleach. The fact that there is no reduction of the alpha cellulose content is due to the previous lignin removal which allows a milder final bleach. From the figures of the chlorine requirements it will be seen that chlorination also gives a great chlorine saving in the refining process. Comparative figures obtained in mill practice are given in Table III and show similar values.

TABLE III—ALPHA CELLULOSE CONTENT, PER CENT

Without Treatment..	88.70	88.92	88.90	88.64	88.18	88.40	88.03
70 per cent Chlorinated	89.60	89.20	89.04	88.90	88.47	88.38	88.08
Extracted	95.28	95.45	95.60	95.62	95.74	95.94	95.80
Final Bleach.....	95.62	95.78	96.20	96.34	96.04	95.99	95.98
Increase in Alpha Through:							
Chlorination	0.90	0.28	0.14	0.26	0.29	—0.02	0.05
Final Bleach	0.34	0.33	0.60	0.72	0.30	0.05	0.18

It will be seen here that there is an increase in the alpha content in the chlorination as well as in the final bleach. In order to obtain an idea as to the lignin removal due to chlorination, a pulp was taken and chlorinated three times. The pulp had a permanganate number of 27 (Johnsen-Noll). The amount of chlorine added was so measured that the chlorine in the first and second chlorination was exhausted in fifteen minutes and in the third chlorination there was still an excess apparent after thirty minutes. The chlorinated lignin was washed out with very dilute caustic soda after each chlorination. After every chlorination, that is, after the alkali extraction, the alpha content, viscosity and lignin was estimated. The results are given in Table IV.

TABLE IV

	Alpha per cent	Viscosity in Centipoises	Lignin Content Noll per cent	Lignin Content König per cent
Raw Cellulose				
after Chlorination	87.14	40.0	2.24	2.16
1st	88.20	34.7	1.57	1.82
2nd	88.42	37.3	1.01	0.94
3rd	88.52	36.8	0.82	0.62

These figures show that with a falling lignin content there is no evident increase in alpha cellulose content. The reduction of the cupramonium viscosity, especially after the first chlorination, can be explained as a phenomenon consequent to the lignin removal. After further treatment, the viscosity will return to its original value. It is suggested here that the lowering of the viscosity cannot be said to be due to any deleterious effect of the chlorination on the fiber. In addition there are also the several analytical results which give the lignin values by two methods and which give seemingly different figures. How far these results were influenced by humidity, etc. was not further investigated for, in view of the unsatisfactory results, the lignin content will not in the future be referred to as a criterion for the refining.

2. Influence of the Liquor Concentration

To investigate the effect of various strengths of liquor concentration on the alpha content and yield, the following experiments were carried out under

controlled conditions. The results are given in Table V and part are also shown graphically in Fig. 1 to give a better conception of the influences.

TABLE V

Temperature deg. C	Time in Hours	¼ per cent NaOH Alpha per cent	¼ per cent NaOH Yield per cent	½ per cent NaOH Alpha per cent	½ per cent NaOH Yield per cent	1 per cent NaOH Alpha per cent	1 per cent NaOH Yield per cent
100	1	92.24	84.0	93.28	81.7	94.04	81.5
100	2	93.17	76.9	94.10	76.9	94.64	76.8
110	1	93.76	75.8	94.70	75.0	95.25	72.2
110	2	94.40	76.7	95.45	68.5	95.68	68.9
110	3	94.96	76.0	96.05	68.2	96.01	68.4
125	1	95.12	...	95.97	...	96.39	...

In all the experiments a pulp which had been prechlorinated with 70 per cent of the chlorine demand was used at 5 per cent consistency. The temperature, time and NaOH concentration were altered. From the results of these experiments, it is shown that under similar conditions a higher NaOH concentration gives a higher alpha and a lower yield. In Table VI are given the results obtained with stronger concentrations and at two different consistencies.

TABLE VI

	5 per cent Consistency Alpha, per cent	10 per cent Consistency Alpha, per cent
1 per cent NaOH	95.78	95.25
5 per cent NaOH	96.17	95.63

As a raw material a 70 per cent chlorinated pulp was again used. The extraction was carried out at 110 deg. C. for ninety minutes. A further experiment was run using a fully bleached pulp having an alpha cellulose content of 86.34 per cent. The extraction was made at 110 deg. C. for ninety minutes at 5 per cent consistency. The results are given in Table VII.

TABLE VII

NaOH Per cent	Alpha per cent
½	93.22
1	93.87
2	93.90

These results show also that the higher NaOH concentration gives a higher alpha content. The results show further that a concentration of over 1 per cent is unnecessary so far as the increase in alpha content is concerned. The highest value obtainable for alpha content has slightly over 96.0 per cent. As Table VII shows, the maximum alpha content obtainable depends primarily on the properties of the raw material used, that is, on its fiber stability and resistance to the attack of hot alkali solutions. It can be accepted indubitably that these properties are degraded by the oxidative bleaching. It is, therefore, not possible in practice to obtain an alpha content of over 96 per cent by the hot process of refining from a single stage fully bleached pulp. According to the properties of the raw material, there will be a point at which a balance is reached depending on the alpha content possible with such properties. There will be found a point past which, in spite of further refining process, no further increase of alpha content is possible. This balance lies at about 96.2 per cent alpha content for a prechlorinated sulphite pulp. A further intensification of the refining process, be it through the use of stronger caustic liquor, lengthening of the reaction time, or increasing the temperature is still immaterial and shows only in a lowering of yield due to the strong degradation of the cellulose or in the higher alkali solubility of the treated pulp.

3. Influence of Time

With reference to the influence of time on the process of refining, some information is already given in Table V. From this, it can be seen that the process of refining proceeds gradually. The increase in alpha content is the greatest at the beginning of the refining process and increases gradually with the reaction time until the highest value is reached. In the pressure extraction (110 deg. C.) the highest value is reached in about three hours. In refining without pressure, the increase in alpha content is slower. However, the curve of the alpha content increase gives likewise a flat curve with increasing time. An experiment with reference to this is given again in Table VIII. The pulp was treated in a water bath with 1 per cent NaOH at 5 per cent consistency using a reflux condenser.

TABLE VIII

Hours	Alpha, per cent 1	2	3	5	8
Raw Cellulose	91.83	92.56	93.22	93.88	94.11
The same chlorinated 70 per cent..	92.11	92.97	93.44	94.00	94.21

As the raw material an unbleached pulp (alpha content 88.45 per cent) and also chlorinated pulp (alpha content 88.58 per cent) was used. It is shown here also that the chlorinated pulp gave better alpha values under the same conditions. Actual mill practice has shown that the highest value is arrived at in a shorter time when temperature, alkali concentration and consistency are in agreement with each other. A further lengthening of the reaction time gives no advantage at all but on the contrary gives a reduced yield.

4. Influence of Temperature

As will be seen in Table V, the increase in temperature gives a quicker rise in alpha values and therefore reaches the highest value quicker. In Table IX are given the values found.

TABLE IX

Deg. C	Time Hr.	NaOH, per cent ¼ Alpha, per cent	½ Alpha, per cent	1 Alpha, per cent
100	1	92.24	93.28	94.04
110	1	93.76	94.70	95.25
125	1	95.12	95.97	96.39

It can be seen from this that with the same time and NaOH concentration, the alpha increase due to temperature increase is very noticeable.

5. Influence of Stock Concentration

From Table VI it will be seen that under otherwise similar conditions a higher consistency gives lower alpha values. This phenomenon may be explained from a purely physical standpoint. In the higher consistency the mixing and the equalization of the liquid take place only partially. At the same time, in the higher consistency the proportion of NaOH to the pulp is more unfavorable than in the case of the lower consistencies. In mill practice the consistency of the stock is held as high as possible because of heat economy but thought must also be given to the apparatus available (circulation pumps, etc.) In passing, it should be mentioned that it is necessary to have a good mixing during the whole refining process.

6. Influence of Double Extraction

In order to estimate the difference of a double extraction against a single extraction, experiments

were run, the results of which are given in Tables X and XI.

TABLE X

No.	NaOH Concentration per cent	Yield per cent	Alpha Cont. per cent
1	1	77.1	96.14
2	½	78.8	95.23
	1½	72.7	96.32
3	¼	84.6	93.61
	¾	73.5	96.63

TABLE XI

No.	NaOH Concentration per cent	Temp. deg. C	Time hr.	Alpha per cent	Yield per cent
1	½	100	3	93.28	81.70
2	¾	100	3	93.80	80.00

These experiments were likewise carried out with a 70 per cent chlorinated stock (alpha content—88.27 per cent). The extraction was carried out always in the same way at 110 deg. C. for ninety minutes at 5 per cent consistency. The only variation was the alkali concentration. (See Table X). The total amount of NaOH remained the same in the three experiments. During No. 1 the total alkali was used for a single extraction. In No. 2 the same amount of alkali was used, but in the proportion of 1 to 1 and in No. 3 the proportion used was 1 to 3.

These experiments show that it is possible to obtain a somewhat higher alpha value with double extraction than with a single extraction using the same amount of alkali, but it must not be overlooked that in the double extraction the total reaction time is lengthened 100 per cent. The yield in the double extraction is, however, much lower, a fact which can also be due to the influence of the double reaction time. As was seen in Table I, the solubility in alkali increases with the reaction time. As to whether there are here any other influences at work was not further investigated. Still, it should be mentioned that it is not improbable that the yield is influenced by the alteration of the pH due to the dissolved substances in the alkali. In a further experiment (see Table XI) the extraction was carried out without pressure and similar results were found. Here also an increase of alpha and a lowering of yield was evident. These experiments were carried out at a consistency of 5 per cent. It will be understood that the double extraction requires also a double heat consumption so the small increase of alpha content is thus somewhat expensive.

7. Influence of Intermediate Treatments

As an investigation of the influence of an intermediate treatment in the double extraction, the experiments shown in Tables XII and XIII were carried out. It was thought that an intermediate treatment such as another chlorination or a weak acid treatment would be beneficial to the degree of purity. It seems that this is not the case for in Table XII it is seen that after a second chlorination (No. 2 and 3) and a following second extraction, only a slight increase in alpha content is found.

Similar values were found for an intermediate treatment with acids (see Table XIII). As already mentioned, the alpha content is not alone decisive for the degree of purity attained. It is, therefore, not improbable that the intermediate treatments are advantageous to the degree of purity although it is not possible to estimate it with the present methods of analysis. The extractions mentioned in Tables XIII and XIV were carried out with a prechlorinated stock at 5 per cent consistency in an autoclave at 110 deg. C. for ninety minutes, while the intermediate

TABLE XII

	1st Extraction		Chlorination	2nd Extraction	
	NaOH per cent	Alpha per cent	Chlor per cent	NaOH per cent	Alpha per cent
1	0.5	94.56	0.2	1.0	96.32
2	1.0	95.89	0.2	0.5	96.16
3	1.0	95.81	0.2	1.0	96.89

TABLE XIII

1st Extraction			2nd Extraction	
Concentration NaOH per cent	Alpha per cent	Intermediate Treatment—per cent on Stock	Concentration NaOH per cent	Alpha per cent
..	....	0.1 SO_2	..	88.82
0.5	95.33	0.1 HCl	1.0	95.66
1.0	94.84	0.1 HCl (94.93)	1.0	95.18
1.0	95.94	0.1 SO_2 (95.97)	1.0	96.11

treatments were made at 3 per cent consistency. If the treatment is given before the extraction (a single extraction) values are obtained such as given in Table XIV.

TABLE XIV

Method of Pretreatment	NaOH Concentration, per cent 0.5	1	2
	Alpha Cellulose, per cent		
0.05 per cent SO_2 + 0.2 per cent Chlor. Wash between. Reaction time 30 min.	95.50	95.78	96.26
0.1 per cent NaOH + 0.2 per cent Chlor. Wash between. Reaction time 30 min.	95.55	96.17	96.06
The same with SO_2 after treatment	95.85	96.33	96.33
0.1 per cent NaOH + 0.05 per cent SO_2 + 0.2 per cent Chlor. Wash between. Reaction time 30 min.	95.99	96.36	96.26

The extraction was also carried out at 5 per cent consistency in an autoclave at 110 deg. C. for ninety minutes and the pretreatment at 3 per cent consistency.

As was expected, these pretreatments gave no obvious difference to the results obtained by extractions without pretreatment. The alpha content is always within the borders to be reached by a normal extraction. These pretreatments can be classified without further ado as an extension of the chlorination, and would seem unnecessary when the chlorination and alkalization are correctly carried out. It is astonishing that the alpha value of the extraction carried out with 2 per cent NaOH is slightly lower than that carried out with 1 per cent NaOH. As an explanation of this, one can draw the conclusion that owing to the intensive pretreatment of the raw material, a 2 per cent NaOH concentration is already too high at a temperature of 110 deg. C. and the degradation of the cellulose has already set in to a considerable extent.

8. Additions to NaOH Extraction

To investigate how far it is possible to use CaO or $Ca(OH)_2$ as a substitute for NaOH, the experiments shown in Table XV were carried out. Here again a 70 per cent prechlorinated stock was used. The extractions were carried out with a 5 per cent consistency at 110 deg. C. for ninety minutes. The caustic concentration was 1 per cent.

TABLE XV

CaO per cent	NaOH per cent	Alpha per cent	Yield per cent	Viscosity in centipoise	Ash per cent
..	100	95.17	74	46.9	0.73
25	75	93.90	79	41.8	1.2
50	50	91.96	81	37.57	2.1
75	25	90.56	83.5	37.4	2.34
100	...	89.62	88.0	35.3	2.40

In further experiments, equivalent amounts of $Ca(OH)_2$ were substituted for the NaOH. The exact liquor concentration was estimated by titration. From the results obtained it is seen (Fig. 2) that with increasing amounts of $Ca(OH)_2$ the yield increases proportionally and the alpha content decreases. Further, a decrease in viscosity is evident (in comparison with the NaOH treatment). One

can explain this perhaps by the fact that the degraded particles do not go into solution and, therefore, give a lowering of the viscosity.

9. Replacement of NaOH (by other bases)

It is interesting to investigate further what influence the addition of other materials to the normal extraction solution would exert on the refining. The following materials were investigated: Na_2SO_3, Na_2S, NaCl, Na_2CO_3. The results are given in Tables XVI to XX. From Table XVI it is seen that with the use of Na_2SO_3 a better yield is obtained. However, the alpha content falls throughout.

TABLE XVI

NaOH Concentration,	Na_2SO_3 per cent	Temperature deg. C.	Time hour	Yield per cent	Alpha per cent
1	....	125	1	67.2	96.39
1	0.5	125	1	76.4	95.75
0.5	....	125	1	78.8	95.87
0.5	0.5	125	1	80.8	95.77
0.25	....	125	1	82.8	95.12
0.25	0.25	125	1	83.3	94.96

From Tables XVII and XVIII, it is seen that Na_2S operates in a similar manner, only here the yield is somewhat better and the alpha content by like yields is somewhat higher. This may perhaps be due to the fact that when Na_2S is used alone it has a refining effect on account of its alkaline properties (see No. 5 Table XVIII). These experiments were carried out at 5 per cent consistency for ninety minutes reaction time and at 110 deg. C.

TABLE XVII

Conc. NaOH per cent	Conc. Na_2S per cent	Temperature deg. C.	Time min.	Yield per cent	Alpha per cent
0.75	....	110	90	78.7	96.24
0.75	0.25	110	90	82.3	96.13
0.50	....	110	90	78.8	95.23
0.50	0.50	110	90	86.4	94.42
0.25	....	110	90	84.6	93.61
0.25	0.25	110	90	89.6	92.18

TABLE XVIII

No.	NaOH Concentration per cent	Na_2S on Stock per cent	Alpha per cent	Yield per cent
1	1	..	96.18	73.2
2	1	5	96.21	82
3	1	10	96.00	83.2
4	1	15	95.47	86.3
5	..	15	90.57	94.2
6	Raw Material		88.30	...

The addition of sodium chloride gave no increase in alpha and no difference in yield could be noticed (see Table XIX).

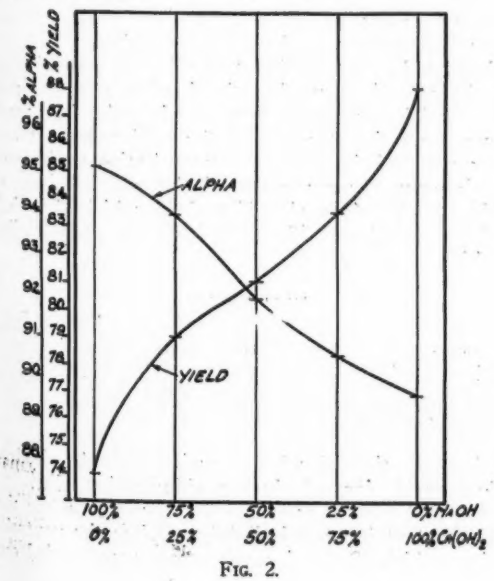

Fig. 2.

TABLE XIX

NaOH Concentration per cent	NaOH on Stock per cent	Temperature deg. C.	Time min.	Yield per cent	Alpha per cent
1	5	110	90	78.7	95.89
1	15	110	90	78.4	95.72
1	..	110	90	...	95.49

In Table XX are given the results found when using Na_2CO_3. From these results it can be concluded that sodium carbonate gave no increase in yield. However, it has a beneficial effect on the refining process as the alpha content distinctly increases with the carbonate content.

TABLE XX

NaOH Concentration per cent	Na_2CO_3 on Stock per cent	Time min.	Temperature deg. C.	Yield per cent	Alpha per cent
1	..	90	110	78.0	95.49
1	5	90	110	78.5	96.18
1	15	90	110	78.4	96.37
..	15	90	110	95.8	91.61

Regarding the advantageous effect of the various additions according to Tables XVI, XVII and XVIII, it can be said that on one hand it is concerned with the displacement of the sodium ion concentration and on the other hand with the important reducing properties of these chemicals. It seems that the addition of a reducing material will hinder the usual oxidative reaction caused by the presence of atmospheric oxygen. Finally from this it can be concluded that the displacement of the atmospheric oxygen by nitrogen gives an alpha increase of 0.06 per cent and an increased yield of 3.7 per cent.

10. Factors Controlling Viscosity

To obtain a desired viscosity one must take it into consideration during the preparation of the raw material. The way and manner of carrying out the cook is decisive for the viscosity and indeed the main consideration is the temperature and hydrogen ion concentration of the cook. Also during the refining process it is only possible to reduce the viscosity. For this purpose the most important is the use of an oxidizing reagent such as chlorine or hydrogen peroxide. The use of these materials for the purpose of lowering the viscosity after the true extraction whether it be as a separate working stage or in conjunction with the usual after bleach, has occasionally, of course, an important influence on the alpha content. This phenomenon can be explained by the fact that the products formed during the oxidative degradation remain in the stock. When one wishes to retain the desired viscosity already obtained in the sulphite cooking, great care must be exercised especially during the bleaching. It is not only necessary to carry out the first stage as chlorination, but the after bleach must be very mild to avoid possible oxidative influences.

In Table XXI are given analytical data which show the alteration of viscosity during large scale refining. Starting from the viscosity of the raw material, in our case the unbleached cellulose, one finds that during the chlorination the viscosity is only slightly influenced. Usually there is a slight drop which may be explained by the removal of viscosity-increasing lignins. After the extraction, the viscosity increases considerably. It can, therefore, be taken that through the extraction the main part of the low viscosity portions are removed and the viscosity of alkali resistant cellulose is measured. No alteration of the viscosity is apparent in the final hypochlorite bleach, providing it is carried out in a mild form. Rather, one finds a slight raising of the viscosity as

shown in Table XXI. It is possible also to obtain an increase in viscosity in a mechanical manner through the washing out of the low viscosity particles of fiber.

TABLE XXI.—ALTERATION IN VISCOSITY DURING THE REFINING PROCESS IN CENTIPOISES.

Unbleached	Chlorinated	Extracted	Bleached and treated with weak acid
31.2	30.2	39.6	41.85
31.2	38.6	51.6	49.7
47.0	47.2	61.2	56.9
20.9	17.5	25.5	26.3
33.7	31.6	61.0	60.0
43.3	42.0	68.3	68.5
34.0	33.7	54.4	55.7
24.1	21.6	39.4	40.2
39.4	37.3	60.9	62.5

A lowering of the viscosity can, as already mentioned, be obtained through the use of chlorine, either with the addition to the extraction or as an excess in the after bleach. An addition to the extraction liquor gave the results shown in Table XXII.

TABLE XXII

Chlorine Calculated per cent	NaOH on Stock per cent	Yield per cent	Alpha per cent	En No.	Viscosity in Centipoises
..	..	...	88.78	1.50	47.16
0.1	15	74.0	96.50	0.42	60.03
1.0	15	77.5	95.54	0.37	58.90
2.0	15	80.0	94.66	0.35	43.40
3.0	15	82.7	93.02	0.32	27.80

The extraction was carried out at 110 deg. C. for a reaction time of ninety minutes at a consistency of 5 per cent. The amount of chlorine added was in the form of chlorine water and it was added to the extraction liquor. It will be seen from these figures that with increasing amounts of chlorine the alpha content as well as viscosity drop while the yield is increased. It must not be overlooked that in these experiments the amount of chlorine added will convert a similar amount of alkali into hypochlorite and thus, with increasing chlorine amounts, a weaker alkali extraction will take place.

11. After Treatment

Under after treatment, the final bleaching takes the most important place, for in most cases the refined pulp must have apart from purity, a good white color when used for further treatment. It is necessary therefore, when a full white is desired in the final bleach, to be very careful when bleaching to avoid a degradation of the alpha content already acquired. One must then observe the following points:

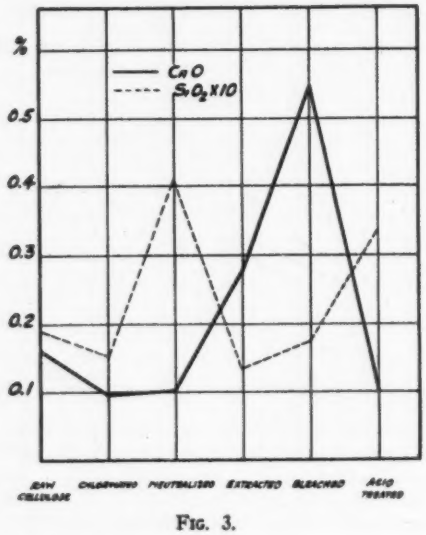

Fig. 3.

1. No excess of chlorine (hypochlorite) to be used.
2. The use of the lowest possible temperature during bleaching.
3. The final bleaching must be made nevertheless in the shortest time possible.

By observing the foregoing points it is possible to obtain not only a high white but also a slight increase in alpha content as the following results, taken from mill conditions, show

Alpha Content before:					
95.71	94.88	96.16	95.99	96.00	96.23
Alpha Content after bleaching:					
96.14	95.88	96.19	96.22	96.14	96.30
Increase in alpha content:					
0.43	1.00	0.03	0.23	0.14	0.07

A lowering in alpha content after the final bleach is due largely to two causes: either the final bleach or the extraction have been carried out under inappropriate conditions, so that a stronger final bleach has been necessary to obtain a satisfactory white. A stronger final bleach, whether through the use of a larger amount of hypochlorite or a higher temperature, causes more or less greater lowering of the alpha content. An important part of the after treatment process is that which concerns the method of reducing the ash content. According to the desired grade a more or less strong acid treatment is necessary. However, the best low ash value obtainable is dependent on the hardness of the water available for washing. Information as to the variation of the ash content during the refining process is given in Table XXIII.

TABLE XXIII

No.	Unbleached Cellulose	Chlorinated	Extracted	Final Bleach + Weak Acid Treatment Wash Water 12.8 deg. H.
	Ash, per cent			
1	0.253	0.224	0.392	0.211
2	0.244	0.223	0.440	0.210
3	0.240	0.226	0.370	0.186
4	0.276	0.324	0.625	0.186
5	0.284	0.316	0.702	0.201

These results were obtained in a mill process using a water having a German hardness degree of 12.8. It will be seen that the ash content varies during the refining process. On the whole, there is a slight lowering of ash after the chlorination which can be attributed to the effect of the hydrochloric acid formed during the chlorination. The increase of ash content is especially noticeable when $Ca(OH)_2$ is used in excess for alkalization. The greatest increase of ash content is apparent after the extraction. This can either be due to a residual alkali or a precipitation of the materials causing the hardness in the mill water. The final ash content after the last wash depends on the strength of the acid treatment and the quality of the water. A quantitative analysis of the important components of the ash is given in Table XXIV (see also Fig. 3 in which the CaO and SiO_2 is given. The SiO_2 is shown as multiplied by 10.)

TABLE XXIV

	R_2O_3 per cent	CaO per cent	MgO per cent	SiO_2 per cent
Raw Cellulose	0.0111	0.1602	0.0379	0.0189
Cellulose—Chlorinated	0.0064	0.0954	0.0228	0.0154
Cellulose—neutralized	0.0161	0.1017	0.0302	0.0412
Cellulose—extracted	0.0276	0.2740	0.0328	0.0134
Cellulose—bleached	0.0176	0.5470	0.0478	0.0173
Cellulose—acid treatment.....	0.0155	0.1012	0.0263	0.0333

Owing to the dissolving action of the hydrochloric acid formed during chlorination, Fe^{+++}, Ca^{++} and Mg^{++} were chiefly dissolved, while the SiO_2 content increased slightly. After the neutralization, which in the foregoing case was carried out

with $Ca(OH)_2$, the metals mentioned increased and there was also a large increase in silica which probably came from the milk of lime. After the extraction the SiO_2 content was lowered, owing to the formation of soluble silicates, while the ash content showed a further increase. This increase can be explained as being due to the presence of hardness in the water which causes a partial precipitation with the NaOH. After the final bleach it is mainly the Ca^{++} and Mg^{++} which increase greatly due to the hypochlorite used. During the acid treatment, which in this case was very mild, the Fe^{+++}, Ca^{++} and Mg^{++} were again lowered with a slight increase of the SiO_2 content due to the precipitation of the water soluble silicates. In order to ascertain the effect of various acids and various concentrations, experiments, the results of which are given in Table XXV, were run.

TABLE XXV

Acid per 100 gr. pulp cc.	Distilled Water			Mill Water 12.8 deg. H.		
	Ash per cent	Alpha per cent	Viscosity in centipoises	Ash per cent	Alpha per cent	Viscosity in centipoises
H_2SO_4						
2	0.178	95.98	42.60	0.296	95.76	44.90
4	0.148	95.82	42.62	0.224	95.82	45.12
6	0.068	95.64	42.88	0.154	95.58	44.42
HCl						
2	0.116	95.70	43.42	0.254	95.82	45.12
4	0.098	95.89	43.42	0.206	95.74	45.12
6	0.065	96.02	42.70	0.130	96.02	45.24
HNO_3						
2	0.184	96.11	43.70	0.298	95.80	45.06
4	0.164	95.92	43.70	0.202	95.94	44.76
6	0.084	96.11	43.72	0.187	95.74	44.18

As raw material, for these experiments, an after bleached refined pulp was used having the following analysis:

Alpha content	95.84	per cent
Ash	0.442	per cent
Viscosity	42.62	centipoises

The amount of acid was added to the pulp at 4 per cent consistency and allowed to react for thirty minutes. The mass was then washed with distilled water or mill water until neutral. It can be seen that hydrochloric acid gives the best final effect and that the alpha content and viscosity are not affected.

These results show above all, that the quality of the water has a great influence and that it is possible to obtain about 50 per cent lower ash content practically throughout, by the use of distilled water. To investigate further the influence of the water quality the following experiment was made: A refined pulp treated with a mild acid treatment was strongly dewatered by suction and then washed with varying qualities of water until neutral. The results are given in Table XXVI. It is possible in this case also to reduce the ash 50 per cent by means of distilled water.

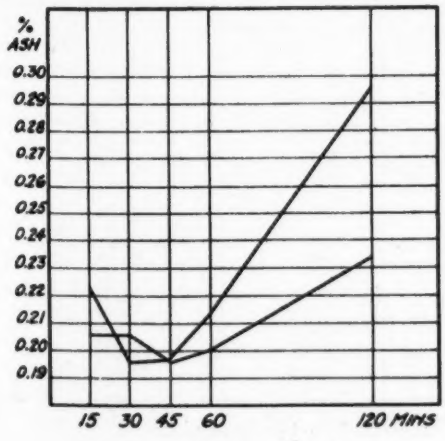

FIG. 4.

TABLE XXVI

	Mill Water	Mill Water Acidified with SO_2	Mill Water Boiled and Filtered	Distilled Water
1	0.1876	0.1215	0.1454	0.0781
2	0.2076	0.1255	0.1245	0.0742

It has been found in mill practice that when washing for a long time, the ash content is again increased. A laboratory experiment was conducted to investigate this and the results are given in Table XXVII and graphically in Fig. 4. Refined pulp was treated with a mild acid treatment for thirty minutes and then sucked dry on a Buechner funnel and washed with mill water of 12.8 deg. hardness. After a given time, tests were taken for ash content.

TABLE XXVII

	Acid and Amount HCl per cent	Per cent Ash after				
		Minutes 15	30	45	60	120
No. 1	1	0.206	0.206	0.196	0.200	0.234
No. 2	1	0.224	0.196	0.197	0.214	0.296
			Wash Water 12.8 deg. H.			

In this case the lowest ash content was found after thirty to forty-five minutes washing time. After this the ash content increased. This increase can be traced back to the absorption by the pulp of the salts giving the hardness to the water.

Cold Refining Process (Mercerization)

By cold refining is meant the treatment of the pulp with proportionately strong liquors (to about 50 per cent) and at temperatures to a maximum of 50 deg. C. In contrast to hot refining it is necessary to consider the recovery, i.e., the regeneration of the used liquor, in order to hold the alkali expense within economic borders. In order to obtain the best possible alpha value it is also necessary in cold refining to start with a pulp which is suitable for cold refining.

1. Pretreatment

Contrary to hot refining it is best and of great benefit to use a fully bleached pulp as raw material for cold refining (also called mercerization). It has been found that an insufficiently purified pulp, as well as an unbleached or half bleached pulp, give objectionable difficulties in the final bleaching stage after the refining. A cause for this may be a lignin polymerization phenomenon or resinification produced by the action of the NaOH. It is possible, however, to obtain a satisfactory white through a strong after bleach, but here a fresh degradation of the alpha content cannot be avoided. In order to obtain the highest possible alpha content it also is necessary to have as a preliminary condition in the cold refining, an undegraded pulp as a raw material. Here again the best conditions are found in a two stage bleaching of which the chlorination stage is as high as possible.

2. and 5. Influence of Liquor and Stock Concentrations

The effects of liquor concentration and consistency on the alpha content are shown in Table XXVIII and graphically in Fig. 5. These experiments were carried out with a highly chlorinated pulp having 88.2 per cent alpha content at a temperature of 20 deg. C.

TABLE XXVIII

NaOH per cent	Consistency of Pulp, per cent 5	10	15	30	
2.5	89.93	89.61	89.23	89.21	Alpha
10.0	97.25	96.35	95.06	92.13	Alpha
5.0	91.98	91.52	90.98	90.12	Alpha
7.5	95.02	94.96	93.93	91.71	Alpha

The alpha content is dependent on the strength of the liquor as well as on the consistency. Higher alkali concentration gives higher alpha values, while higher consistency gives lower alpha values. In order to obtain the maximum alpha value possible, it is therefore necessary, according to the above tests, to use much higher liquor concentrations.

To obtain some information as to the possible maximum alpha value obtainable, the experiments given in Table XXIX were carried out. The treatment was with 17.5 per cent NaOH at 20 deg. C. and at 5 per cent consistency. The reaction time was thirty minutes.

TABLE XXIX

No.	Raw Material	Alpha Content Before Treatment per cent	Alpha Content After Treatment per cent	Increase in Alpha per cent	Yield per cent
1.	Hot refined coniferous wood pulp	96.00	98.62	+2.62	92.96
2.	Hot refined beech wood pulp	95.87	98.50	+2.63	92.50
3.	Coniferous wood pulp chlorinated to 70 per cent	89.42	98.32	+8.90	87.54
4.	Beech wood pulp chlorinated to 70 per cent	88.50	98.02	+9.52	84.54
5.	Coniferous wood pulp bleached	75.40	83.45	+8.05	83.83
6.	Coniferous wood pulp bleached	82.60	91.44	+8.84	83.78
7.	Coniferous wood pulp bleached	89.20	98.33	+9.13	90.40

It can thus be seen that it is possible to obtain practically the same alpha value of around 98.5 per cent with hot refined, chlorinated or bleached pulps. It is further obvious from these experiments that degraded pulps, in this case No. 5 and 6, which were attacked through overbleaching, give insufficient alpha values in the cold refining.

3. Influence of Time

The results given in Table XXX show the influence of time and it can be concluded that after forty-five minutes of reaction time there is no further increase in alpha values. It can also be seen that the yield is not influenced by a further alkali treatment and remain practically constant.

TABLE XXX

Raw Material	Refining Time, minutes 15 per cent	30 per cent	45 per cent	60 per cent	
Coniferous wood pulp bleached	95.30	97.44	98.33	98.35	Alpha content
	93.22	92.80	91.43	91.40	Yield
Beech wood pulp hot refined	97.20	98.30	98.38	98.40	Alpha content
	95.80	93.60	93.30	93.30	Yield

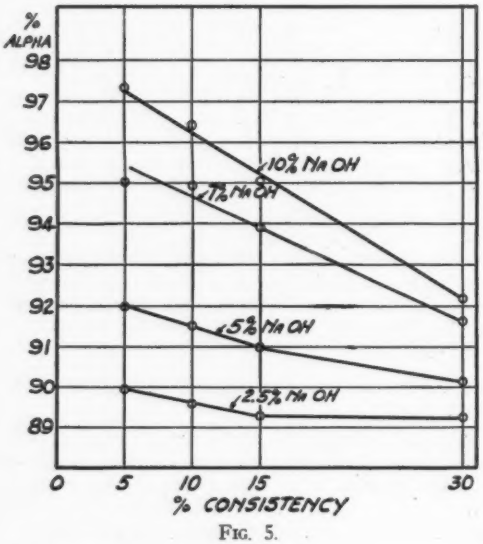

FIG. 5.

Further control tests have shown that, given a thorough mixing, a reaction time of 30 to 45 minutes is practically always sufficient and that lengthening the time only gives unimportant alterations of the alpha values.

4. Influence of Temperature

Although cold refining, as the name implies, is generally carried out without temperature increases, it was interesting to investigate the effect of temperature increases up to nearly boiling point. The results of these experiments are given in Table XXXI.

TABLE XXXI

Temperature deg. C.	5 per cent NaOH Alpha per cent	5 per cent NaOH Yield per cent	10 per cent NaOH Alpha per cent	10 per cent NaOH Yield per cent
5	90.65	87.2	96.71	80.5
25	89.56	87.2	93.65	86.50
50	89.16	93.0	93.61	87.2
75	91.05	84.5	94.16	81.5
95	93.91	80.4	96.80	80.3

The experiments were carried out with a chlorinated pulp and the mercerization at 5 per cent consistency. It was found that the alpha values as well as the yield were strongly influenced by the temperature. A low point in the alpha value at 50 deg. C. is remarkable. In order to ascertain if this was also the case for bleached pulp, the experiment was carried out with a fully bleached pulp having an 88.4 per cent alpha content with two additional liquor concentrations. The results are given in Table XXXII and graphically in Fig. 6 and 7.

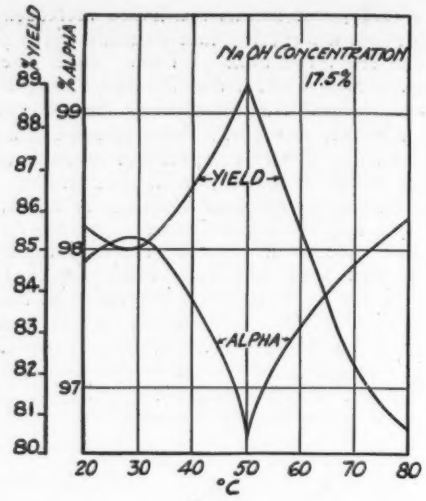

FIG. 6.

TABLE XXXII

Temperature deg. C.	7.5 per cent NaOH Alpha per cent	7.5 per cent NaOH Yield per cent	17.5 per cent NaOH Alpha per cent	17.5 per cent NaOH Yield per cent
20	96.94	87.6	97.92	85.7
30	97.23	86.5	98.26	85.1
35	97.15	86.5	97.76	86.0
40	97.00	86.8	97.76	86.4
45	96.42	87.5	97.38	87.3
50	95.42	90.0	96.66	89.1
55	95.64	89.2	97.12	87.4
60	95.91	88.7	97.56	85.4
70	96.32	88.3	97.85	81.9
80	96.74	87.5	98.24	80.7

It was found in this case also that 50 deg. C. gave the highest yield and the lowest alpha content. A

further influence could, however, be established. The pulps mercerized at the higher temperatures were proportionately more easily washable and the fibers remained bulky.

In order to ascertain the effect of temperature on weakened fibers, an overbleached pulp was used in a series of experiments, the results of which are given in Table XXXIII and graphically in Fig. 8. The raw material was a high white pulp having the following analysis: alpha content—80.42 per cent; copper number—1.86; viscosity—8.88 centipoises. The treatment with alkali was carried out at 5 per cent consistency.

TABLE XXXIII

Temperature deg. C.	NaOH Concentration per cent	Alpha per cent	Viscosity centipoises	Ca No.	Yield per cent
50	6.6	89.86	8.72	1.37	94.1
50	9.7	92.53	8.42	1.32	87.66
50	12.5	94.70	8.24	1.00	83.38
50	15.2	95.42	7.82	0.87	81.47
50	17.8	96.33	7.72	0.86	81.37
85	6.6	93.50	8.53	1.21	89.9
85	9.7	95.85	8.20	0.93	83.4
85	12.5	97.13	7.63	0.88	78.7
85	15.2	97.60	7.44	0.56	76.6
85	17.8	97.80	7.24	0.58	75.3

Apart from the fact that it was not possible to reach the highest alpha content, the alpha content rises fairly regularly with the increase of liquor concentration. The yield curves also follow the liquor concentrations. With the increase of liquor concentration it was found that the viscosity dropped.

6 and 7. Mercerization and Viscosity

As already mentioned, it was found that using a raw material not sufficiently purified gave a hard bleaching pulp after refining which could only be bleached to a pure white at the cost of the alpha content. It was now investigated how far the addition of an oxidizing or reducing agent to the mercerizing liquor would have a good effect on the following after bleach. In the first tests Na_2S, which was already known as advantageous in the hot refining, was again used. The mercerization was carried out at 5 per cent consistency with 17.5 per cent NaOH at room temperature. The results given in Table XXXIV show that Na_2S has a beneficial effect on the refining process and gives an increase in alpha and also an increase in yield.

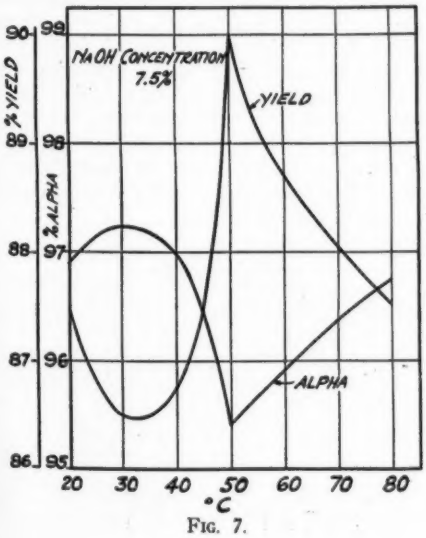

Fig. 7.

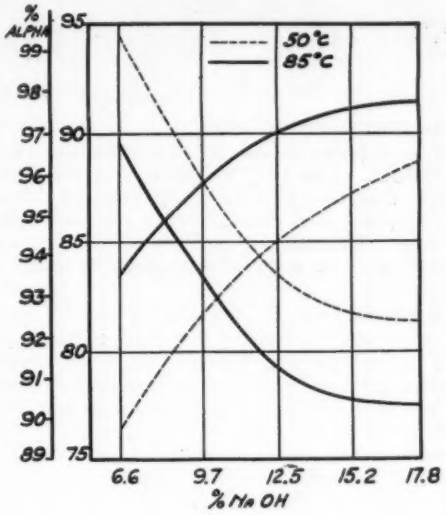

Fig. 8.

TABLE XXXIV

	20 deg. C.			50 deg. C.	
	Without Na_2S	10 per cent Na_2S	30 per cent Na_2S	10 per cent Na_2S	30 per cent Na_2S
Alpha Content, per cent..	97.83	98.2	98.45	98.50	98.62
Yield, per cent.....	83.8	85.2	87.4	88.7	88.5

It was noticed also that the treated pulp was somewhat lighter in color than that treated without the addition of Na_2S. The pulp used in these tests was a chlorinated stock having 87.2 per cent alpha content. The pulp was easily bleached and gave after bleaching an average alpha value of 98 per cent. The same pulp was also mercerized with the addition of Na_2SO_3. The results are given in Table XXXV. It seems that an addition of Na_2SO_3 has less effect in the cold refining than in the hot refining. As an explanation, it can perhaps be taken that in the cold refining the oxidative reactions are less active.

TABLE XXXV

	5 per cent Na_2SO_3	10 per cent Na_2SO_3	30 per cent Na_2SO_3
Alpha Content, per cent.....	97.45	97.46	97.54
Yield, per cent.....	....	....	84.72

As oxidative addition agents H_2O_2 and HNO_3 were used. The results given in Table XXXVI are from chlorinated pulp treated at 5 per cent consistency with 17.5 per cent NaOH for forty-five minutes at 20 deg. C. including the addition of Perhydrol Merck.

TABLE XXXVI

Perhydrol per 100 gram pulp, cc.	Alpha Content per cent	Viscosity centipoises	Yield per cent
..	98.14	....	....
4	98.30	12.54	83.4
8	98.00	9.23	81.2
12	97.60	7.10	80.5

It will be seen that the main reaction of the addition of H_2O_2 results in a large drop in viscosity; the yield is lowered and the alpha is somewhat lower. It is seen then that Perhydrol is a medium by which the viscosity could be lowered or regulated. As the addition of the HNO_3 to the mercerization liquor is not possible, the pulp was treated with HNO_3 before the mercerization. The same pulp was used as in Table XXXVI. The nitric acid treatment was carried out at 3 per cent consistency for thirty minutes at a temperature of 80 deg. C. (HNO_3 = 65 per cent). The results obtained are given in Table XXXVII.

TABLE XXXVII

HNO_3 per 100 gram pulp, cc.	Alpha Content per cent	Viscosity centipoises	Yield per cent
4	98.4	16.54	83.5
8	98.62	11.96	82.3
12	98.68	8.51	81.5

From the orientation experiments it can be seen that a nitric acid pretreatment is very beneficial to the alpha content. The pulp obtained was throughout very light colored and was easily bleached, during which bleaching the alpha content fell only about 0.2 per cent. The drop in viscosity shows that nitric acid could also be used as a regulation agent for viscosity.

A further medium for the regulation of viscosity seems to be the heating of the cold mercerization mixture. The following experiments were made: A chlorinated pulp with 87.59 per cent alpha content and a viscosity of 42.25 centipoises was mercerized in the cold and then brought up to temperature, sucked dry and washed. The mercerization took three hours while the heating which followed took twenty to thirty minutes. The results are given in Table XXXVIII. This method seems to give besides the viscosity regulation, another advantage, that of achieving its object without loss in alpha content. Whether or not this holds good for stronger liquor concentrations or also if higher alpha content is possible, was not investigated.

TABLE XXXVIII

NaOH Concentration per cent	Temperature Mercerization deg. C.	Temperature Highest deg. C.	Alpha per cent	Viscosity centipoises
3	— 6	+ 20	90.45	39.25
3	— 6	+ 50	90.38	16.81
3	— 6	+ 95	91.04	5.13
3	—10	+ 20	91.02	27.82
3	—10	+ 50	91.84	7.66
3	—10	+ 95	91.98	4.98

8. The After Treatment

With reference to the after treatment of cold refined pulp, the after bleach is of primary importance. When unbleached or half bleached pulp is used as a raw material, it is hardly possible to reach a full white in the after bleach without losing a more or less large amount of the alpha content. As to the best working conditions, it was found that a chlorinated pulp, freed as far as possible from lignin, and then carefully bleached made the best raw material.

Between the bleaching and the following mercerization, a weak nitric acid treatment has shown itself to be very advantageous especially when carried out hot. Such a pulp has a good white with a high alpha content. So that, except for weak acid treatment for low ash purposes, generally no further after treatment is necessary. The results of some experiments along these lines are given in Table XXXIX.

Of these results No. 4 pulp showed the best white. The mercerization was made with 17.5 per cent NaOH at 5 per cent consistency, while the acid treatment was carried out at 3 per cent consistency.

Procedure

For all experiments wet pulp from mill production was used. The permanganate number of the raw material was between 18 and 25 (Johnsen-Noll). The prebleach was by chlorination at 3 per cent consistency using chlorine water. After the consumption of the chlorine, the pulp was thoroughly washed and treated with 0.5 per cent NaOH on pulp basis and after thirty minutes washed free of alkali. When not especially noted, all water used was mill water with a hardness of 12.8 deg. The pressure extraction was carried out in a rotating autoclave heated in an oil bath.

Analytical Methods

Moisture: Drying to a constant weight at 100 deg. C. Alpha content was estimated by the method of the Hercules Powder Company. About three grams of pulp + 0.01 gr. are weighed in a weighing bottle. In order to estimate the wet weight a moisture test is previously run. The pulp is placed in a 250 cc. porcelain beaker and 35 cc. of 17.5 per cent NaOH at 20 deg. C. is poured over it and it is allowed to stand three minutes. Then the pulp is disintegrated for three minutes with a glass rod having a flattened end. This is done without turning or rubbing only by moving the glass rod in a vertical direction. After this time 10 cc. of NaOH are added and again it is disintegrated for 2.5 minutes. Then again 10 cc. of NaOH and 2.5 minutes disintegration. After a further 10 cc. of NaOH are added it is disintegrated for three minutes, then another 10 cc. NaOH are added and it is disintegrated for one minute. The beaker is covered with a watchglass and allowed to stand for thirty minutes in a water bath at 20 deg. C. The total amount of NaOH = 75 cc., total reaction time = forty-five minutes. Then 75 cc. of water at 20 deg. C. are added and well mixed and filtered through a jena glass filter 11.G.2 using a suction flask. The mat is then washed with one liter of water at 20 deg. C. and sucked dry. The suction is disconnected and 40 cc. of 10 per cent acetic acid at 20 deg. C. is added. The acid is absorbed in the mat and allowed to react for five minutes, sucked off and washed with one liter of water until a neutral reaction. The mat is then quantatively transferred to the weighing bottle and dried at 100 deg. C. to a constant weight. Copper number is estimated by the new method of Schwalbe-Hagglund (*4*). One gram of finely rasped pulp is placed in a boiling Fehlings solution and boiled for exactly three minutes. The whole is filtered through a jena glass filter 11.G.4 and the washed cuprous oxide brought into solution with ferric sulphate and titrated with permanganate.

The viscosity of a 1 per cent solution in cuprammonium solution (1.52 per cent Cu and 20 per cent NH_3 plus 0.2 per cent succrose) was measured in Hoeppler viscosimeter.

Literature Cited

(1) *Der Papier Fabr.* 1937 Niv 1/2.
(2) *Der Papier Fabr.* 1937 Niv 36/37
(3) *Dinglers Polyt. J.* 276, 411, 1890.
(4) "Die Chemische Betriebskontrolle in der Zellstoff und Papierindustrie" III, page 396. Schwalbe and Sieber. Berlin. 1931.

TABLE XXXIX

No.	Raw Material	Treatment Before Mercerization	Treatment After	Alpha Content per cent	Ash per cent
1.	Coniferous wood pulp			97.80	0.320
2.	Bleached	0.1 per cent HNO_3 50 deg. C.		98.42	0.280
3.	Alpha 87.2 per cent	0.1 per cent HNO_3 50 deg. C.	0.2 per cent HCl	98.54	0.182
4.	Ash—0.345 per cent	0.1 per cent HNO_3 95 deg. C.	0.2 per cent HCl	98.60	0.140

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING MAY 6, 1939

SUMMARY

Cigarette paper .....9 ctns., 10 bls., 3 cs.
Wall paper .....7 bxs.
Paper hangings .....3 bls., 1 cs.
Newsprint .....4346 rolls
Wrapping paper .....4 pkgs., 5374 rolls, 3572 bls., 5 cs.
Bag paper .....36 cs.
Drawing paper .....4 cs.
Filter paper .....21 cs.
Transparent paper .....2 cs
Surface coated paper .....156 cs.
Basic paper .....12 cs.
Basic board .....4 cs.
Decalcomanias .....3 cs.
Decalcomania paper .....36 cs.
Duplex paper .....1 cs.
Transfer pictures .....2 cs.
Tissue paper .....1 cs.
Cellophane paper .....1 cs.
Grey paper .....5 bls.
Stencil paper .....1 cs.
Paper tubes .....84 cs.
Raw paper .....1 cs.
Straw boards .....70 rolls
Miscellaneous ....21 pkgs., 1517 rolls, 4 ctns., 72 bls., 47 cs.

CIGARETTE PAPER

M. Speigel & Sons Co., Inc., *Vigilant*, Gdynia, 10 bls.
De Mauduit Paper Corp., *Normandie*, Havre, 2 cs.
Champagne Paper Corp., *Normandie*, Havre, 1 cs.
Braunstein Freres, Inc., *Normandie*, Havre, 9 ctns.

WALL PAPER

S. K. Lonegren, *Gripsholm*, Gothenburg, 7 bxs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Merchant*, London, 1 cs., 3 bls.

NEWSPRINT

Perkins Goodwin & Co., *Hamburg*, Hamburg, 396 rolls.
Jay Madden Corp., *Hamburg*, Finland, 200 rolls.
N. Y. Evening Journal, *Markland*, Liverpool, N. S., 777 rolls.
Herald Tribune, Inc., *Markland*, Liverpool, N. S., 1458 rolls.
World Telegram, *Markland*, Liverpool, N. S., 585 rolls.
Brooklyn Daily Eagle, *Markland*, Liverpool, N. S., 526 rolls.
Herald Statesman, Inc., *Markland*, Liverpool, N. S., 42 rolls.
W. H. Bell, *Markland*, Liverpool, N. S., 92 rolls.
Jay Madden Corp., *Scanmail*, Kotka, 270 rolls.

WRAPPING PAPER

——, *Astrid Thorden*, Mantypuoto, 5374 rolls, 1197 bls.
——, *Gripsholm*, Gothenburg, 2375 bls.
Japan Paper Co., *Jean Jadot*, Antwerp, 5 cs.
F. C. Strype, *Jean Jadot*, Antwerp, 4 pkgs.

BAG PAPER

D. T. Young, *American Shipper*, Liverpool, 36 cs.

DRAWING PAPER

Devoe & Reynolds Co., Inc., *American Merchant*, London, 4 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Merchant*, London, 21 cs.

TRANSPARENT PAPER

M. J. Corbett & Co., *N. Amsterdam*, Rotterdam, 2 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Jean Jadot*, Antwerp, 156 cs.

BASIC PAPER

Dingelstedt & Co., *Pennland*, Antwerp, 12 cs.

BASIC BOARD

Schwartz & Co., Inc., *N. Amsterdam*, Rotterdam, 4 cs.

DECALCOMANIAS

Sellers Transportation Co., *Hamburg*, Hamburg, 3 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Britannic*, Liverpool, 1 cs. (simplex), 35 cs. (duplex).

DUPLEX PAPER

Gevaert Co., of America, *Jean Jadot*, Antwerp, 1 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., *Bremen*, Bremen, 2 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., *Britannic*, Liverpool, 1 cs.

CELLOPHANE PAPER

D. M. Hicks, Inc., *Sanyo Maru*, Kobe, 1 cs.

GREY PAPER

Nestle Milk Products, Inc., *Britannic*, Liverpool, 5 bls.

STENCIL PAPER

——, *American Merchant*, London, 1 cs.

PAPER TUBES

——, *Hamburg*, Hamburg, 84 cs.

RAW PAPER

Rhoner Gehrig & Co., *Bremen*, Bremen, 1 cs.

STRAW BOARDS

——, *N. Amsterdam*, Rotterdam, 70 rolls.

MISCELLANEOUS PAPER

The Borregaard Co., Inc., *Gripsholm*, Gothenburg, 1517 rolls, 72 bls., 21 pkgs.
Products From Sweden, *Gripsholm*, Gothenburg, 4 ctns.
Remington Rand, Inc., *Asakasan Maru*, Kobe, 24 cs.
Bianchini Ferier, *Normandie*, Havre, 2 cs.
H. W. Robinson Co., *Normandie*, Havre, 10 cs.
Coty Processing Co., *Normandie*, Havre, 10 cs.
Roger & Gallet, *Normandie*, Havre, 1 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., *Exchester*, ——, 131 bls. rags.
Padawer Co., *Silvaplana*, Bombay, 100 bls. cotton waste.
Bank of The Manhattan Co., *Silvaplana*, Bombay, 100 bls., cotton waste.
——, *California*, Glasgow, 18 bls. rags.
Joe Levy & Son, *Siboney*, Havana, 23 bls. rags.
J. Cohen & Son, Co., Inc., *Britannic*, Liverpool, 10 bls. rag cuttings.
——, *Britannic*, Liverpool, 123 bls. rags.
——, *American Shipper*, Manchester, 174 bls. paperstock.
Public National Bank Trust Co., *American Shipper*, Manchester, 6 bls. rags.
H. S. Cramer Co., Inc., *Norderney*, Buenos Ayres, 225 bls. bagging.
Castle & Overton, Inc., *Norderney*, Buenos Ayres, 151 bls. bagging.

OLD ROPE

W. Steck & Co., *Black Gull*, Antwerp, 54 coils.
National City Bank, *American Merchant*, London, 71 bls.

CHINA CLAY

English China Clay Sales Corp., *Antonia*, Liverpool, 320 bags.

WOOD PULP

Gottesman & Co., Inc., *Vigilant,* Gdynia, 1050 bls. wood pulp, 210 tons.
Gottesman & Co., Inc., *Drottningholm,* Gothenburg, 600 bls. wood pulp.
———, *Vigilant,* Gdynia, 2315 bls. wood pulp, 463 tons.
Pulp Sales Corp., *Scanyork,* Wiborg, 1702 bls. sulphite, 327 tons.
Pulp Sales Corp., *Scanyork,* Kotka, 2350 bls. sulphite, 470 tons.
Bank of N. Y. Trust Co., *Hamburg,* Hamburg, 535 bls. wood pulp, 107 tons.
———, *Black Gull,* Rotterdam, 119 bls. wood pulp, 25 tons.
Castle & Overton, Inc., *Scanmail,* Wiborg, 510 bls. bleached pulp, 101 tons; 794 bls. unbleached pulp, 155 tons.
Pulp Sales Corp., *Scanmail,* Wiborg, 2336 bls. sulphite, 450 tons; 1308 bls. sulphite, 261 tons.
Chase National Bank, *Jean Jadot,* Antwerp, 89 bls. wood pulp.
Castle & Overton, Inc., *Valdona,* Tallinn/Reval, 1854 bls. sulphate, 317 tons.
M. Sone, *Valdona,* Riga, 2540 bls. sulphite, 508 tons.

WOOD PULP BOARDS

Standard Fibre Specialties Corp., *Gripsholm,* Gothenburg, 44 bls.
Jay Madden Corp., *Scanmail,* Wiborg, 150 bls. 12 tons.
Jay Madden Corp., *Scanmail,* Kotka, 209 rolls, 56 tons.

ALBANY IMPORTS

WEEK ENDING MAY 6, 1939

Halifax Pulp & Paper Co., Ltd., *Bennestvet,* Sheet Harbor, N. S., 12154 bls. mechanically ground pulp.
Parsons & Whittemore, Inc., *Valdona,* Tallinn/Reval, 2500 bls. sulphite, 503 tons.

PHILADELPHIA IMPORTS

WEEK ENDING MAY 6, 1939

Halifax Pulp & Paper Co., Ltd., *Bennestvet,* Sheet Harbor, N. S., 2071 bls. mechanically ground pulp.
———, *Scanmail,* Stockholm, 120 bls. sulphite, 20 tons.
Jay Madden Corp., *Scanmail,* Wiborg, 41 rolls wood pulp boards, 21 tons; 54 bls. wood pulp boards, 4 tons.
J. W. Hampton Jr., & Co., *Scanmail,* Kotka, 90 rolls newsprint.
Public Ledger, Inc., *Scanmail,* Kotka, 502 rolls newsprint.
Jay Madden Corp., *Scanmail,* Kotka, 136 bls. newsprint.
M. Sone, *Birmania,* Trieste, 502 bls. wood pulp.

WILMINGTON IMPORTS

WEEK ENDING MAY 6, 1939

Halifax Pulp & Paper Co., Ltd., *Bennestvet,* Sheet Harbor, N. S., 2416 bls. mechanically ground pulp.

BALTIMORE IMPORTS

WEEK ENDING MAY 6, 1939

Congoleum Nairn Co., *Black Gull,* Antwerp, 166 bls. rags.
———, *Black Gull,* Antwerp, 458 bls. wood pulp, 102 tons.
Washington Post, *Markland,* Liverpool, N. S., 1889 rolls newsprint.
———, *Scanmail,* Stockholm, 210 bls. sulphite, 35 tons.
Bulkley Dunton Pulp Co., Inc., *Scanmail,* ———, 510 bls. sulphite, 86 tons; 600 bls. mechanical pulp, 101 tons.
Jay Madden Corp., *Scanmail* Kotka, 1333 rolls newsprint.

NORFOLK IMPORTS

WEEK ENDING MAY 6, 1939

E. Butterworth & Co., Inc., *Black Gull,* Antwerp, 127 bls. bagging.
Darmstadt Scott & Courtney, *Black Gull,* Antwerp, 82 bls. bagging.

NEW ORLEANS IMPORTS

WEEK ENDING MAY 6, 1939

M. Sone, *Nienburg,* Hamburg, 620 bls. wood pulp.

MONTREAL IMPORTS

WEEK ENDING MAY 6, 1939

Pagel Horton & Co., Inc., *Idefjord,* Sweden, 7750 bls. wood pulp.

Big Development for Australia

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 8, 1939—The following Canadian Press despatch, dated from Sydney, Australia, May 7, is published here:

"Canada may expect to lose two-thirds of her annual newsprint trade of 150,000 tons with Australia through a £4,000,000 development of the industry here. Production, likely in full swing by the end of next year, will have an initial output of 27,000 tons and ultimately 100,000 tons.

"Under a scheme financed by Austrialian newspaper interests, the newsprint will be mostly manufactured from swamp gum-trees in Tasmania, where the operating company owns 123,000 acres of forest in the north and 250,000 acres in the derwent valley in the south. The project has received financial aid from the Tasmanian government.

"The company expects to sell at £14 a ton compared with the present price of £18 a ton for imported Canadian newsprint. For the first stage with its restricted output, the Austrialian government's tariff board has recommended a sliding scale of bounty which gives the company no bounty or duty if the price is above £18 10s, rising to a maximum of £4 at an imported price of £12 10s or under, with a small duty if the price is under £15 rising to a maximum of 10s. This assistance will protect the industry from all competition and in any case its constituent newspapers have contracted to take its whole output."

Henry W. Stanley Speaks at Boston

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 1, 1939—Henry W. Stanley, the new secretary of the Wrapping Paper Division of the National Paper Trade Association, spoke briefly at a meeting of the New England Paper Merchants Association held at the Parker House Wednesday evening on his work and what he hopes to accomplish. President John H. Brewer was in the chair with 28 present.

A talking motion picture, "The Romance of Rope," lasting 35 minutes and sponsored by the Plymouth Cordage Company, was flashed on the screen.

Hawthorne Petition Dismissed

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 10, 1939—The National Labor Relations Board has directed that the petition for investigation and certification of representatives of employees of Hawthorne Paper Company, Kalamazoo, Mich., filed by United Paper Mill Workers, Local Industrial Union 398, affiliated with the Congress of Industrial Organizations, be dismissed.

Board action was based upon results of a secret ballot election held April 18, 1939, resulting in an 84 to 33 count against the CIO union.

Buys Paper Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 10, 1939—During the week ended April 29, the Government purchased $41,942.00 worth of paper and allied products under the Walsh-Healey Act as follows: Hanover Paper Corporation, N. Y. C., $11,480.00 for toilet paper for the CCC; L. Hyman & Sons, N. Y. C., $11,712.00 for toilet paper for the Post Office; and Universal Paper Products Co., Chicago, Ill., $18,750.00 for paper cups for the TVA.

NEW, UNIVERSAL pH INDICATOR

Useful for measuring pH of sulphite, soda and kraft pulps, of bleach liquors, and of other solutions throughout the pulp and paper industries, this completely self-contained pH potentiometer is direct-reading with either Glass, Quinhydrone or Hydrogen electrode. Compactly built and readily portable, it is conveniently operated and retains all the traditional L&N reliability and excellence of workmanship. Outstanding advantages: Temperature compensation for either glass or quinhydrone electrodes; a voltage scale as well as a pH scale; *full accuracy up to 95% relative humidity*; only 5 ml of sample required; new, small, rugged glass electrode; mahogany case, strongly built of half-inch material, well finished; separate compartment for batteries. Entire equipment designed to operate for years at full sensitivity and accuracy.

Write for Catalog E-96

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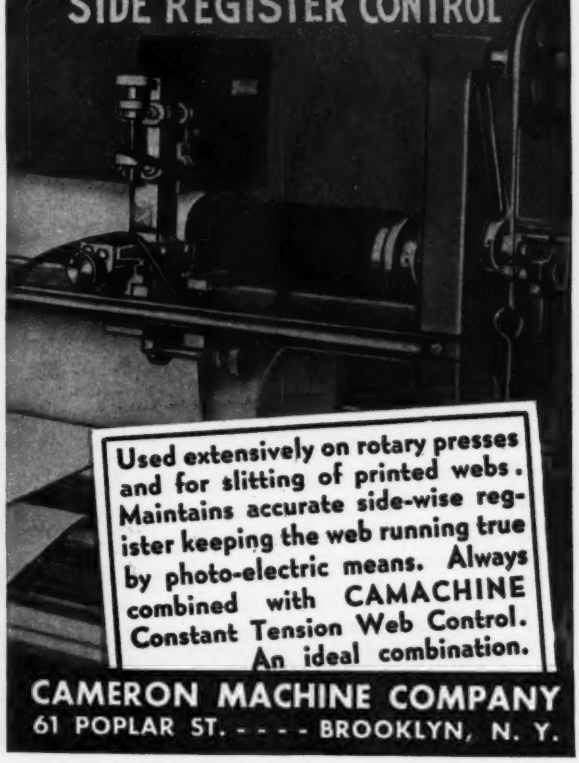

Used extensively on rotary presses and for slitting of printed webs. Maintains accurate side-wise register keeping the web running true by photo-electric means. Always combined with CAMACHINE Constant Tension Web Control. An ideal combination.

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, May 10, 1939.

Sales volume in many grades of paper continues at a good level for the current week. Reports from many manufacturers' representatives, jobbers, and general paper merchants, indicate consumption is at a good level for a wide range of grades. In general, business activity is expanding slowly in many kinds of consumer goods, with activity in some lines of durable goods, such as automobiles, under trade expectations for the week.

The index of general business activity for the week ended April 29 rose to 86.4 per cent, compared with 86.2 per cent for the preceding week, and with 75.5 per cent for the corresponding week last year. More than seasonal declines occurred in five components, including automobile and lumber production, while all carloadings were higher. Compared with an estimated normal of 100 per cent, the index reached a peak of 95.5 per cent on December 10, 1938, declined later in that month to lesser peaks the first week in January and in the last week of that month, to drop below 90.0 per cent early in February of this year. The current index figure is approximately the same as on October 12, 1938.

Paper production continues to rise. The production ratio of over 200 mills for the week ended April 29 was estimated at 82.9 per cent, compared with 82.2 per cent for the previous week, and with 70.4 per cent for the week ended April 29 last year. Paper board production for the like period was a little lower at a capacity of 68.0 per cent, compared with 59.0 per cent for the corresponding period last year.

No important change in the newsprint situation has been reported this week. Consumption continues below trade expectations, due to the decline in advertising linage. This is attributed in part to the fairs at San Francisco and at New York, the theory being, that large users of newspaper space, such as General Motors, Ford, Chrysler and other advertisers in the tobacco and some other industries, have curtailed newspaper advertising this year, while spending considerable money for publicity at the fairs, particularly at the New York World's Fair.

Demand for many grades of paper in the New York market continues at a good level. Some grades of sulphite papers are reported a little more active this week, with the demand reported good in the lower grades of sulphite bond papers. Sales volume in some grades of book paper is a little higher this week, though consumption in book paper is under trade expectations. The demand for tissue papers continues at a good level.

The kraft paper market continues active and under a good, steady consumer demand, production and orders are maintained at a good level. Prices on all grades of paper are unchanged.

Production and sales of paper board continue good and prices are relatively firm. Business is reported in some quarters as fully 12 per cent above that of last year and the outlook continues favorable.

Mechanical Pulp

The market situation in mechanical pulp continues unchanged for the current week. Prices remain firm and production continues at a good level under a steady demand.

Chemical Pulp

No important change in demand or prices has been reported in any grade of domestic or imported pulp for this week. Mill consumption continues at a good level, stocks on hand are reported as not excessive and the price structure is reasonably satisfactory.

Old Rope and Bagging

The demand for old domestic No. 1 Manila rope continues steady with prices unchanged for this week. The demand for old bagging is rather light and this market is reported as relatively quiet for the week. Prices hold firm and unchanged at prevailing market quotations.

Rags

New white shirt cuttings are reported as easier this week under a less urgent demand from England. Prices remain unchanged. Mixed khaki cuttings are lower this week and currently quoted at from 2.25 to 3.00, while O. D. khaki cuttings are lower and currently quoted at from 3.50 to 3.60. Demand for roofing rags is rather light this week, and in some quarters of the trade lower prices are expected. No change from prevailing prices, however, has been reported at this date.

Old Waste Paper

Waste paper prices are unchanged for this week, with demand reported as fair for many grades. Although some talk is heard of lower prices on folded news and on No. 1 mixed paper, no change in quotations has been reported to date.

Twine

No important change in demand or prices has been reported in twine for the current week. Prices continue firm and unchanged at prevailing market levels.

Paper Men To Hold Outing at Hartford

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 1, 1939—The annual outing of the New England Paper Merchants Association is to be held at Hartford, Conn., in June, the date to be announced later. The committee of arrangements is composed of Bulkeley Van Schaack, Rourke-Eno Company, Inc., chairman; Arthur C. Biza, Henry Lindenmeyr & Sons, and H. B. Harwood, John Carter & Co., Inc., all of Hartford.

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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, May 10, 1939.

BLANC FIXE—Prices on blanc fixe continue firm and conform to prevailing market quotations. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER — Quotations on bleaching powder continue firm and unchanged at prevailing market prices. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as improved for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at from 7½ to 8 cents per pound; 80-100 mesh, at from 8 to 8½ cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Prices on caustic soda continue firm and unchanged at prevailing market quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged at prevailing market levels. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $12 per ton, at mines. Imported clay is quoted at from $13 to $25 per ton, ship side.

CHLORINE—Prices on chlorine continue firm and conform to prevailing market quotations. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The demand for rosin is reported as improved for the current week. "G" gum rosin is quoted at $4.75; 'FF" wood rosin at $4.13, per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.68 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake continue firm and unchanged at prevailing market levels. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Prices on soda ash continue firm and unchanged at prevailing market quotations. Prices on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn starch market reports that prices continue firm for the current week. Globe pearl is quoted at $2.60 per 100 pounds; special paper starch at $2.70 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina continue firm and conform to prevailing market prices. The commercial grades are quoted at $1.15; iron free at $1.30, per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Prices on sulphur continue firm and unchanged at prevailing market levels. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Quotations on talc continue firm and conform to prevailing market prices. Domestic talc is offered at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $20 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.12½	@	4.62½
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	7.75	@	9.75
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	30.00	@	32.50
Chip	30.00	@	32.50
Sgl. Mla. Ll. Chip	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated	55.00	@	57.50
Kraft Liners	45.00	@	—
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	@ 36.50	32.20	@ 37.75
85% Rag	.....		29.90	@ 35.00
75% Rag	23.60	@ 27.75	24.75	@ 29.00
65% Rag	.....		21.65	@ 26.25
50% Rag	17.55	@ 21.50	18.70	@ 22.75
25% Rag	14.65	@ 17.75	15.80	@ 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.60	@ $10.50	$9.75	@ $12.00
No. 2	7.70	@ 9.50	8.90	@ 10.75
No. 3	6.85	@ 8.25	8.00	@ 9.75
No. 4	7.00	@ 8.50	8.20	@ 10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.30	@	$12.75
No. 2 Glossy Coated	9.70	@	11.00
No. 3 Glossy Coated	8.60	@	10.00
No. 4 Glossy Coated	8.05	@	9.25
No. 1 Antique (watermarked)	.....		8.05 @ 9.25
No. 2 Offset	7.45	@	8.50
A Grade E. F.	7.20	@	8.25
A Grade S. & S. C.	7.45	@	8.50
B Grade E. F.	6.65	@	7.75
B Grade S. & S. C.	6.90	@	8.00
C Grade E. F.	6.40	@	7.50
C Grade S. & S. C.	6.65	@	7.75
D Grade E. F.	6.10	@	7.00
D Grade S. & S. C.	6.35	@	7.25

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	25.00	@	26.00
Dry	25.00	@	28.00
(Delivered)			
No. 1 Domestic and Canadian	29.00	@	31.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.25	@	2.75
Prime Qualities—			
Easy-Bleaching Sulphite	1.90	@	2.00
Strong Unbleached Sulphite	1.80	@	1.95
(On Dock, Atlantic Ports)			
Kraft Bleached	2.50	@	2.75
Kraft Light & Strong	1.60	@	1.75
Kraft No. 1	1.45	@	1.60
Kraft No. 2	1.35	@	1.40
(F. o. b. Pulp Mill)			
Kraft Domestic	1.25	@	1.75
(Delivered)			
Soda Bleached	2.55	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	7.00	@	7.25
Silesias No. 1	4.50	@	4.75
New Unbleached	6.75	@	7.00
Blue Overall	4.90	@	5.00
Fancy	1.75	@	2.00
Washables	1.50	@	1.60
Mixed Khaki Cuttings	2.25	@	2.50
O. D. Khaki Cuttings	3.50	@	3.60

Old Rags

White, No. 1—			
Repacked	2.90	@	3.13
Miscellaneous	2.10	@	2.25
White, No. 2—			
Repacked	1.50	@	1.60
Miscellaneous	1.25	@	1.40
Thirds and Blues—			
Repacked	1.30	@	1.40
Miscellaneous	1.15	@	1.20
Roofing Rags—			
No. 1	1.05	@	1.10
No. 2	.90	@	.95
No. 3 (bagging)	.55	@	.65
No. 4	.60	@	.65
No. 5A	.60	@	.65

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25
Old Rags			
No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

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No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.75	@	1.90
Domestic	1.75	@	1.80
Wool Tares, light...	1.60	@	1.70
Wool Tares, heavy..	1.80	@	1.90
Bright Bagging.....	1.60	@	1.70
Manila Rope—			
Foreign	2.60	@	2.75
Domestic	2.75	@	3.00
Jute Threads.....	2.75	@	3.00
Sisal Strings	1.50	@	1.60
Mixed Strings....	.55	@	.60

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.30	@	2.40
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.60	@	1.75
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag ...	.70	@	.75
Solid Flat Book...	.55	@	.60
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.10	@	1.20
Ledger Stock Colored	.60	@	.70
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut....	1.40	@	1.50
New Cuttings.....	1.00	@	1.20
Old Kraft Machine— Compressed bales.	.65	@	.70
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue.	.40	@	.45
Strictly Folded....	.37½	@	.42½
No. 1 Mixed Paper..	.17½	@	.22½

Twines

(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.12¾	@	.14¾
White Hemp.....	.13¾	@	.15¾
Fine Polished—			
Fine India.....	.16	@	.18
Unpolished—			
Box	.09½	@	—
Paper Makers.....	.09½	@	.10½
Tube Rope.....	.10¼	@	.12½
Wall Paper.....	.10¼	@	.12½
Wrapping	.12	@	—
Soft Fiber Rope...	.12	@	.14
Cotton	.16	@	.19
(Hard Fiber)			
Medium Java.....	.11	lb	.17
Mex. Sisal.....	.10	@	.16
Manila	.16	@	.23

Domestic	2.65	@	2.75
Sisal Rope	1.75	@	1.85
Mixed Rope.....	.50	@	.60
Transmission Rope...	1.90	@	2.00
Soft Jute Rope	2.00	@	2.25
Jute Carpet Threads.	.75	@	.90
Gunny Bagging—			
Foreign	1.50	@	1.65
Domestic	1.40	@	1.50
Bleachery Burlap....	2.50	@	2.70
Scrap Burlap—			
Foreign	1.35	@	1.40
Domestic	1.25	@	1.40
Scrap Sisal.....	1.65	@	1.75
Scrap Sisal for Shredding	1.80	@	2.10
Wool Tares, Heavy..	1.40	@	1.50
New Burlap Cuttings	2.25	@	2.40
Aust. Wool Pouches.	2.25	@	2.50
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging..	.90	@	1.00
No. 2 Bagging.....	.45	@	.60

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03¼
New White No. 1....	.06¾	@	.07
New Light Flannelettes	.05	@	—
Silesias No. 1.....	.04¾	@	—
New Black Silesias..	.03¾	@	.04
Soft Unbleached.....	6.50	@	7.00
Blue Cheviots.....	.05	@	.05¼
Fancy	.02½	@	.03
Washable	.02¾	@	.03

Cottons—According to grades—			
Blue Overalls.....	.04¼	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.02½	@	.03
O. D. Khaki.....	.03	@	.03¼
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B. V. D. Cuttings...	.06¾	@	.07

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04¼	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Old Blue Overalls...	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62¼
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	.90	@	1.10
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias.....	3.75	@	4.00

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

Shirt Cuttings—			
New White, No. 1.	.06½	@	.07
New White, No. 2.	.03½	@	.04
Light Silesias.....	.03½	@	.04
Silesias, No. 1....	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04½	@	.05
Cottons—According to grades—			
Washable No. 2....	.01	@	.01¼
New Blue.....	.01	@	.01¼
Fancy Percales...	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	@	2.25
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	1.10
Domestic No. 1...	—	@	1.05
Domestic No. 2...	—	@	.85
Roofing Bagging..	—	@	.75

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.65	@	1.75
Domestic	1.50	@	1.75
Manila Rope.....	—	@	3.00
Sisal Rope.....	1.50	@	1.75
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.75
No. 2.....	.95	@	1.00
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	.45	@	.50
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 2 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White.	1.75	@	1.80
No. 2 Soft White.	1.30	@	1.40
No. 1 Mixed.....	.65	@	.75
Solid Ledger Stock..	1.45	@	1.50
Ledger Stock, white.	1.15	@	1.20
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy.	.60	@	.75
Manila Cuttings....	1.45	@	1.50
Print Manila.....	.45	@	.50
Container Manila...	.35	@	.40
Kraft Paper.....	.75	@	.80
No. 1 Mixed Paper..	.22½	@	.27½
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.40	@	.45
Old Newspapers....	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White.	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light..	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.70	@	.85
Manila Envelope Cuttings, Extra Quality	2.00	@	2.10
No. 1 Old Manila...	.65	@	.70
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.65	@	.75
Mixed Papers.....	.15	@	.17½
Print Manila.....	.45	@	.55
Container Manilas..	.27½	@	—
Old Newspapers....	.30	@	.37½
Paper Wool Strings.	.50	@	.65
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated boxes....	.30	@	.35
Kraft corrugated boxes	.60	@	.65
Screening Wrappers.	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.50	@	2.65

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.20
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White	$35.50	@	—
No. 1 Tints	36.50	@	—
No. 2 White	25.50	@	—
No. 2 Tints	26.50	@	—
No. 2 Golden Rod..	27.50	@	—
No. 3 White	21.00	@	—
No. 4 White	15.00	@	—
No. 4 Tints	16.00	@	—
No. 4 Golden Rod...	17.00	@	—
Direct mill shipment in three-ton lots			
No. 5 White	$10.50	@	—
No. 5 Tints	11.50	@	—
No. 5 Golden Rod..	12.00	@	—
No. 6 White	9.00	@	—
No. 6 Tints	9.50	@	—
No. 6 Golden Rod..	11.00	@	—
No. 7 White	8.00	@	—
No. 7 Tints	8.50	@	—
No. 7 Golden Rod..	10.00	@	—
Book—			
No. 1 M. F.	$7.00	@	—
No. 2 M. F.	6.50	@	—
No. 3 M. F.	5.35	@	—
No. 1 S. C.	7.25	@	—
No. 2 S. C.	6.75	@	—
No. 3 S. C.	5.85	@	—

Coated Book & Litho

Ton Lots (resale)

No. 1	$12.00	@	—
No. 2	10.25	@	—
No. 3	8.90	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.25
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.15
No. 1 Manila.....	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2.....	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..)	46.00	@	—
Sheets	54.00	@	—

Pulp

Ground wood.....	$29.00	@	—
Unbleached sulphite.	44.00	@	—
Bleached sulphite...	54.00	@	—
Kraft	50.00	@	—
Soda	54.00	@	—

Old Waste Paper

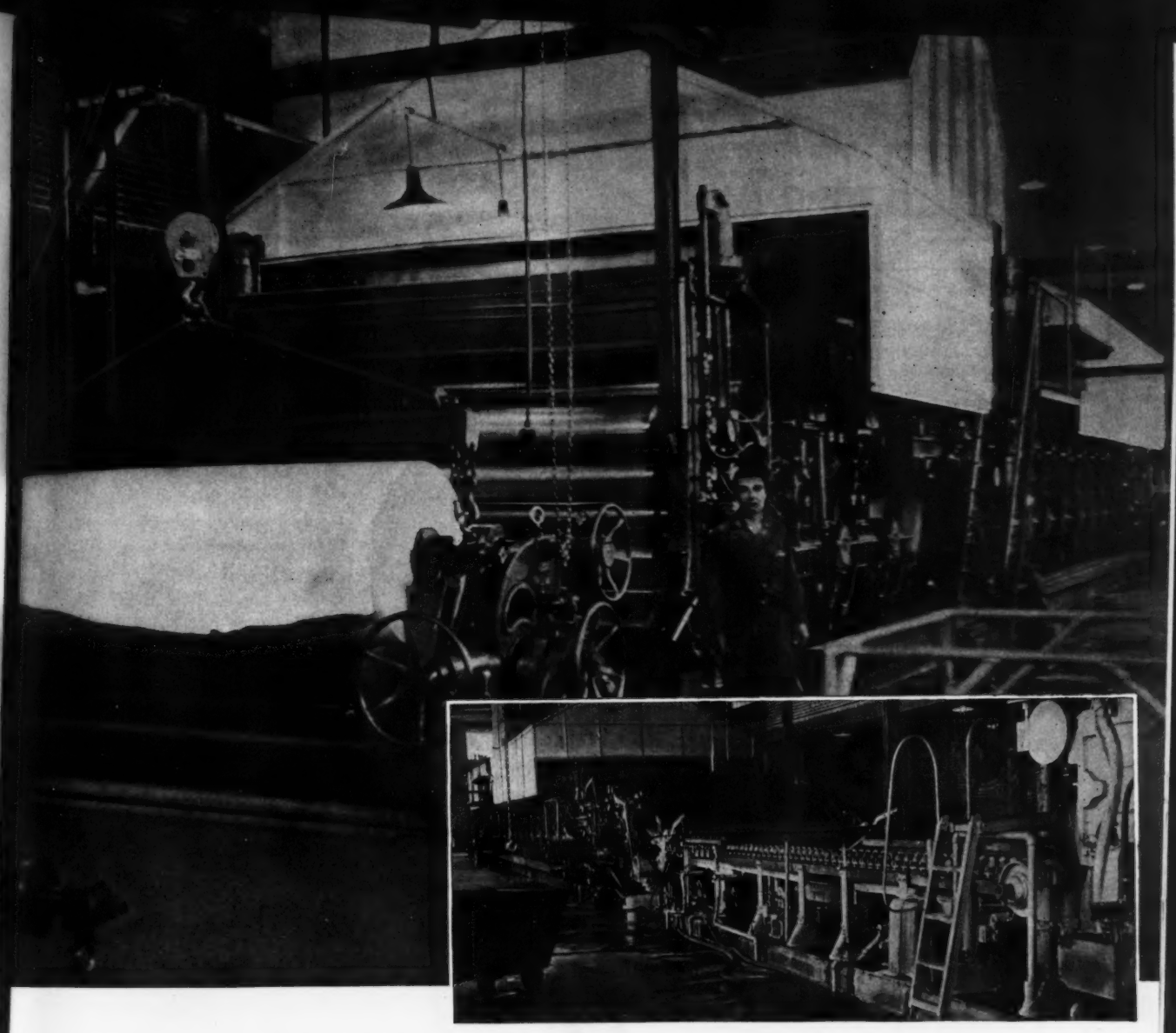
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.00	@	—
Soft White.....	1.75	@	—
White Blk. News..	1.25	@	1.10
Book and Ledger—			
Flat Magazine and Book Stock (old)	.70	@	—
Light and Crumpled Book Stock.	.60	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f.o.b. Toronto)

No. 1 White Shirt Cuttings	.06¼	@	.06½
Light Prints.....	.02½	@	.02¾



Latest Combination Yankee Machine

This Combination Yankee Machine was installed late in 1938 for Southern Advance Bag and Paper Company, Inc., Hodge, Louisiana. As makers of Yankee dryer cylinders for over fifty years, we are proud to present this example of "Puseyjones" craftsmanship, representing the last word for the manufacture of high grade M. F. and M. G. kraft specialties.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-making Machinery. Wilmington, Del.